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ENGINEERING FINANCE COMMERCE

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THE HONORABLE JOHN V. A. MACMURRAY
UNITED STATES MINISTER TO CHINA

By George E. Sokolsky

THE KYOTO CONFERENCE

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MANCHURIA AT THE KYOTO CONFERENCE

By George Bronson Rea

JAPAN AND THE NAVAL CONFERENCE

By K. Sato

Vol. XXV November, 1929 No. 11

SHANGHAI, PEKING, TOKYO AND MANILA

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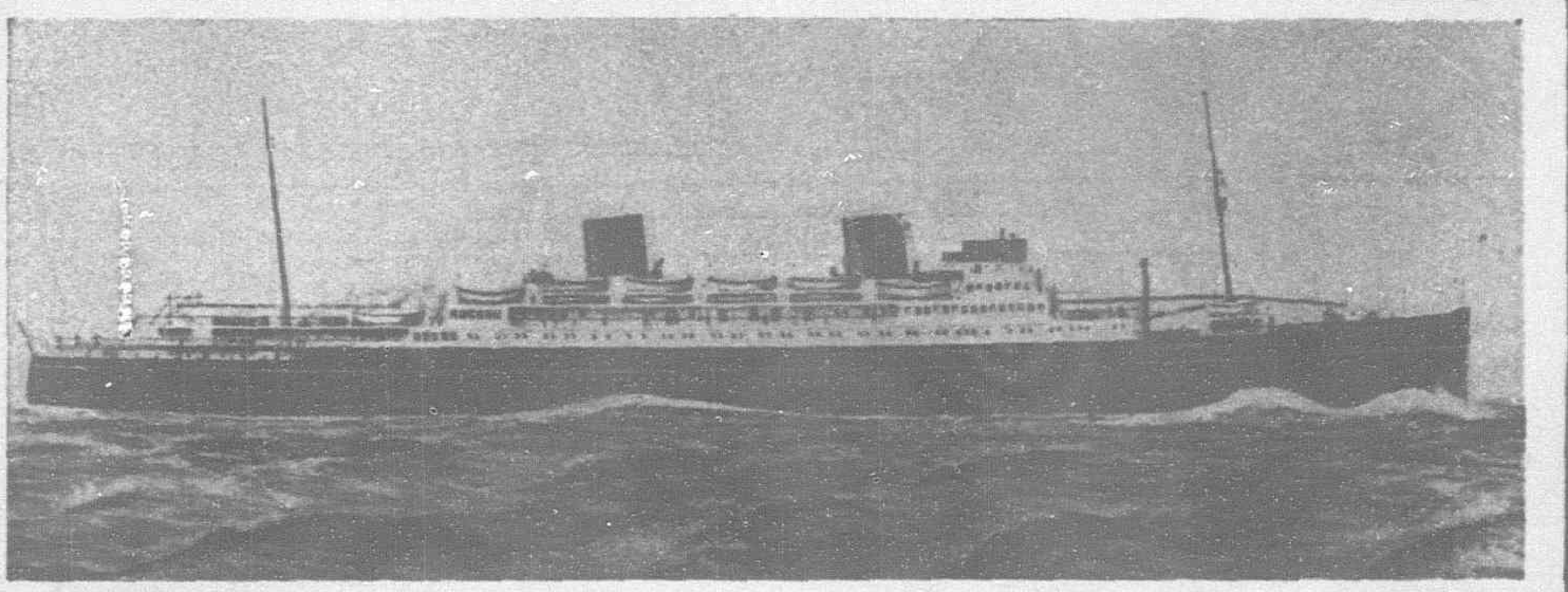

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The Hon. JOHN VAN ANTWERP MACMURRAY
United States Minister to China
1925—1929

The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXV SHANGHAI, NOVEMBER, 1929 No. 11

The Honorable John V. A. MacMurray

American Minister to China

By GEORGE E. SOKOLSKY

Few American diplomats can boast the career of John Van Antwerp MacMurray who have recently resigned as United States Minister to China to assume a professorship at John Hopkins University. It is understood that Mr. MacMurray was offered an ambassadorship but that he was unable to assume the financial burdens which such positions entail. Again, the American Government loses a brilliant servant because of a niggardly policy of inadequate salaries and allowances, thus placing upon its representatives abroad the responsibility of sacrificing themselves and the welfare of their families while serving their country. Each year offers its example of able men leaving the American Foreign Service for other fields where the remuneration, at any rate, makes decent living possible without unjustifiable raids upon one's own resources. The loss of Mr. MacMurray to the American Foreign Service will indeed be great, for he has served efficiently in many capacities, as chief of the Near Eastern Division of the State Department, as Chief of the Far Eastern Division, as Chargé in Peking and Tokyo and finally as Minister to China.

While Secretary of Legation, Mr. MacMurray compiled and edited that scholarly and massive collection of "state papers, private agreements and other documents, in reference to the rights and obligations of the Chinese Government in relation to foreign powers, and in reference to the inter-relation of those powers in respect to China, during the period from the Sino-Japanese War to the conclusion of the World War." The volumes, now generally referred to as "MacMurray" are the standard work on the subject. They represent the fullest statement of China's international relations and provide, at last, a full and authoritative record of China's international relations.* In his preface to these volumes, Mr. MacMurray, lucidly and philosophically, sets forth a basis for an understanding of the modern history of China, which is so remarkably sound and just that it is a pity that it is perhaps another gem lost in a preface to an important book. He says :

> The conditions—particularly the financial requirements—incidental to the war with Japan compelled a readjustment of China's attitude towards foreign nations and towards their resources and their influences. The Chinese nation found itself perforce face to face with the world, and under the necessity of accommodating itself to a relationship with it. Thenceforward, the problem of China was to avail itself of the material resources and experience of the West, while retaining what was vital in its own institutions and preserving as best it could not merely the integrity of its territories, but its political and national entity. How clearly this problem of assimilating the new conditions to the old and of adapting the old ideas to the new has been realized by those responsible for the destinies of the country—how wisely, how courageously, and how disinterestedly they have acted in seeking solutions of the problem—how well and how loyally they have been served by the various foreign interests to which they have from time to time turned for assistance and co-operation—those are speculations in regard to which some indications may be found in the data here gathered together, but for which no categorical answers are possible. There have been times of progress and of reaction ; there has been confusion of purposes ; there has been blind Utopianism, and bitter disillusionment ; but the process of association of foreign with Chinese interests has gone on almost without interruption or pause, China repeatedly seeking foreign assistance in the solution of its problems of industrial, economic and administrative development and giving in return rights that carried with them in many instances at least an implication of political interest.
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> This process has been marked by certain critical events which have in turn initiated new phases of development ;—first, the rapprochement with Russia, immediately prompted by the apprehensions arising out of China's defeat at the hands of Japan ; them the Battle of Concessions, in 1898, originating with Germany's exaction of the lease of the Kiaochow Territory ; thereupon, the abortive reaction that found expression in the Boxer movement of 1900, irresolutely abetted and restrained by the Manchu Court ; the succeeding period of reconstruction, when China sought to restore and stabilize normal relations with the Powers, and those Powers endeavored to establish among themselves an equilibrium based upon the mutual recognition of existing interests and upon the adoption of the principles of preservation of Chinese territorial and administrative integrity and maintenance of equality of commercial opportunity for all nationalities in China ; then the defeat of Russia by Japan, in 1904-5, with the consequent transfer to the victor of a great share of both the material advantages and the political influence theretofore enjoyed by Russia ; in 1911, the overthrow of the Manchu Dynasty, which brought with it an intensified preoccupation with questions of internal development, and which was the beginning of the period of unrest and civil dissension which continues to the present time ; † then the outbreak of the European War, in 1914, affecting China economically through the dislocation of foreign trade and the drying up of the European money markets to which it had hitherto looked for financial accommodation at need, and perhaps more profoundly affecting it politically through Japan's entering the war and taking military occupation of the Kiaochow Leased Territory and other German concessions in Shantung Province, and through the Treaties of May 25, 1915 ; and lastly, the entry of China itself into the war, in August 1917.
>
> Throughout these phases of development, financial, economic and industrial concessions have been made the objects of international policies; such advantages have been sought by Governments—both directly, in the form of general conventional stipulations, and indirectly, in the form of special grants to particular banks or industrial organizations,—through all the means available to one State in its intercourse with another ; the holders of such concessions have often spoken with the voice of their Governments in insisting upon their own construction of the rights granted to them ; and such commitments to individuals of one nationality, even when left unutilized and allowed to lapse by the terms of the concession, have now and again been claimed as a basis of protest against a grant to the nationals of any other country. The result of this merging of individual with governmental interests have been that matters which would elsewhere be of merely commercial character, susceptible of judicial determination in case of dispute, are in China matters of international political concern, for the settlement of which the ultimate recourse is to diplomatic action. It is thus in a sense true that the international status of the Chinese Government is determined and conditioned by its business contracts with individual foreign firms or syndicates, scarcely if at all less than by its formal Treaties with other Governments. It is at any rate seldom that any international situation relating to China can be fully understood without reference to the intricate fabric of quasi-public as well as of public obligations which qualify the freedom of action of the Chinese Government.

Mr. MacMurray arrived in China on July 5, 1925, and presented his credentials to Marshal Tuan Chi-jui in Peking ten days later. In his statement to Marshal Tuan at the time, he clearly set forth American policy which has not been changed since then :

> "My Government * * * * has full confidence that your administration will respect its international obligations resulting from treaties to which China is a party.
>
> "Certain of these obligations are, in accordance with the Washington Conference, subject to re-examination and eventual revision. My

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* A supplementary volume was prepared for the Kyoto Conference.

† Although this preface was written in 1919, it holds good at this moment.

> Government desires to see the plans of the Conference carried out in such a manner as to assist the Chinese people towards a sound national life.
>
> "To attain this purpose mutual confidence and goodwill is the essential requisite. Such feelings on America's part are traditional and may be relied upon to support any effort of China's to work out in loyal co-operation with the friendly powers means for the establishment of a more satisfactory basis of international relationship."

Few Ministers have been pitted into a more difficult and puzzling situation than Mr. MacMurray faced when he assumed his post in China. The May 30 Affair has only occurred two months before. China was seething with Communism, anti-foreignism, anti-Christianity—with conditions approximating Boxer days, except on a larger and more sinister scale. Industry, shipping, banking, the entire economic life of the country was paralyzed by a general strike, which seemed to include the workers of the entire nation. In Canton an independent Government existed which was openly in alliance with Soviet Russia and which was dominated by the aggressive and capable personality of M. Borodin. In Peking sat M. Karakhan, clever, forensic, cynical Ambassador of Soviet Russia to China, who hoped to use China as a spring-board of the world revolution. Shanghai was an armed camp; merchant volunteers and landing parties from the gunboats in the Whangpoo River were patrolling the city against Communist outrages, while the Chinese population was terrorized by the Communist Party of China which was presided over by the curious personality of Li Lih-san, a communist who shook the country for a year and then disappeared from the scene into oblivion. Politically, China was disunited, in chaos and at war with the world. Socially, new forces were being generated, the characteristics of which no one could at the moment fathom. The Powers were uncertain and not in harmony. Great Britain, the greatest sufferer from this situation, had not yet formulated a new policy and was being driven between the extremes of die-hardism and defeatistism. Smaller Powers were maliciously hoping to achieve some slight gain from the helplessness of the Great Powers, which were only helpless because of their persistent friendship for the Chinese people, their unwillingness to resort to force, their determination not to seize territory. In this moment of universal madness, Mr. MacMurray maintained an attitude of dispassionate calmness; he evinced an ability to discern the salient issues through the darkening clouds of propaganda. Never pessimistic, he saw, in the confusion, the struggle for a new China, born out of the impact with Western civilization. In an article in *Foreign Affairs*, published just before he came to China, he said:

> At present the obstacle to such a development is the prevailing political chaos in China, and the accompanying disintegration of administrative authority. This is doubtless a crisis through which China is compelled to pass as a result of the political and social traditions formed by her people during the longest coherent history of any nation now extant. One may feel discouraged that the end of this period of disorganization is not yet in sight. But no one familiar with the fine qualities of the Chinese people can doubt that there will eventually be a reintegration of their national life. When that time comes, China will inevitably pattern herself more and more closely after our Western world, and of course largely through the means provided by foreign capital. The way in which foreign capital meets its responsibilities in serving the ends of the new China will, more than any other factor, determine the solution of that greatest of all problems confronting mankind—the relationship that is to exist between the civilizations of the East and the West.

Mr. MacMurray's friendship for China was not a new phase, not a pretty cloak to wear on state occasions, but a tried and tested friendship, which, for instance, at the Washington Conference was undoubtedly of the greatest value to this country. Mr. MacMurray, at this Conference, was at the head of the Technical Staff dealing with Pacific and Far Eastern Questions of the American delegation — the pivotal organ so far as China was concerned.

It is one of those curious coincidences of American relations with China that the Chinese so often forget those Americans who have been of greatest service to them; yet remember favorably such men as have never accomplished a single thing for China except to blow increasingly loud blasts on their own trumpets. Whereas, Mr. MacMurray's services to China since he became a secretary of legation were of inestimable value to the country, because of some slight pique, a group of narrow-minded Chinese instigated one of their American propagandists to visit the United States for the specific purpose of damaging the reputation and career of a significant servant of the American Government. During the Summer of 1927, Doctor Tom Millard visited Williamstown and there painfully relieved himself of a diatribe of spite and hatred as part of an effort of a small and insignificant group of minor Chinese officials to wreck a career of a diplomat and scholar only because he was experienced and able and possessed a capacity for the absorption and presentation of facts. Unfortunately for these propagandists they were without knowledge of what their Chinese associates would do. For instance, when it became necessary in the pursuit of internal Chinese politics for the Kuomintang leaders to sever all connection with the Communists and to publish broadcast the evils of the Communist régime, every detail of the Communist evil in the Canton and Hankow days was given the imprimatur of the Kuomintang and of the foremost leaders of the Government.* The documents in this struggle between Nationalism and Communism fully justified the fears of foreigners in China between 1925 and 1927 and gave the full sanction of unquestioned facts to Mr. MacMurray's policy which may be described as follows:

1. An attitude of fair neutrality towards all warring factions in the country until one of them should have proved a capacity to govern a sufficiently large part of the country to justify the claim of being representative of the Chinese people;
2. The protection of American life as far as it was practical to do so;
3. The maintenance of the treaty relations between China and the United States until such treaties have been revised or replaced by agreement between the United States and China;
4. Keeping always in view the aim and desire of the United States to assist China in the achievement of her national aspirations, particularly in the implementing of the resolutions of the Washington Conference.

This was a sound program which Mr. MacMurray was able to carry to a successful consummation in spite of Chinese and American propagandists who, having no clearly defined program themselves, hit in the dark at anyone and everyone who declined to believe that black was white simply because they so described it. Doctor Tom Millard's vicious campaign failed and Mr. MacMurray returned to China after a visit in the United States of two months, during which period he was able to iron out all the problems which had arisen as a result of this malevolent, untruthful and disgusting attempt to villify him in his own country.

This policy was forcefully evident, during the trying days of 1926 and 1927 when the life of every foreigner outside of Shanghai was menaced by the incidents of civil war. Yet, it was Mr. MacMurray who signed the first agreement with China settling the Nanking Outrage on terms which maintained the dignity of the United States, while at the same time refrained from placing undue burdens upon China.

In the April 1928 issue of the *Far Eastern Review*, the following summary of these negotiations was given:

> During the month of March, Sir Miles Lampson, British Minister to China, entered upon negotiations with the Nationalist Ministry of Foreign Affairs for a final conclusion of the Nanking Outrage between Great Britain and the Nanking Government. For a time it appeared that these negotiations would meet with success, but ultimately they failed because the Nationalist Government insisted upon offsetting their own expression of apology for the Outrage by an expression of regret on the part of the British Government for the barrage which was set up around Socony Hill on that day by British and American gunboats to protect the lives largely of American citizens, including the American Consul and his family. Similarly, the Nationalist Government attempted to force the British to include in the agreement settling the Nanking Outrage a statement with regard to the revision of treaties. The British Government refused to agree to any such proposal and at the last moment Sir Miles Lampson left Shanghai without reaching a settlement * * * *.
>
> When Mr. MacMurray arrived in Shanghai he realized that a settlement with honor and dignity was, at the moment of his arrival, impossible * * * *. He determined to leave Shanghai to inspect conditions in the Yangtze Valley, travelling from Shanghai to Chungking, a distance of approximately 1,400 miles. In the meantime, Mr. E. S. Cunningham, American Consul-General in Shanghai, continued conversations with members of the Ministry of Foreign Affairs, in which he told them exactly how far the United States would agree to go.
>
> There was an impression among the Chinese that Mr. MacMurray would have to settle the Nanking Incident because it was not desirable to have this question outstanding during the presidential campaign; they, further, believed that there were elements in the United States which so favored them that they would agree to a settlement without honor and dignity. These impressions were unfortunate because they encouraged the rather inexperienced members of the Nationalist Foreign Office, most of whom were for the first time in their lives associated directly with foreign affairs to take a stiff-necked view of the situation. Mr. Cunningham, it is believed was successful in breaking down this attitude, although when Mr. MacMurray returned to Shanghai on March 26, the Nationalist Government was not yet prepared to do more than talk. Within a day of Mr. MacMurray's arrival, it was known in important Nationalist circles that Mr. MacMurray would not remain in Shanghai

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* Full details will be found in the China Year Book, 1928 and 1929.

> after March 31 and that the Incident would either be settled by them or he would return to Peking. His very definite stand in the matter, his known friendship for the Chinese people, the failure which the Ministry of Foreign Affairs had met in their negotiations with the British, the certainty of failure if they continued a policy of playing with words in their negotiations with Mr. MacMurray, resulted in success and on March 30 notes agreeing to a settlement were signed—a diplomatic victory for Mr. MacMurray, who had found a solution to a vexed problem without subjecting himself to trickery which was designed to utilize the settlement of the Nanking Outrage solely to influence the current of political events within the Nationalist Government.
>
> The United States demanded that the Nationalist Government should apologize for the looting, murder, robbery and indignity at the hands of Nationalist troops; secondly, it was demanded that there should be reparation for loss of life and property, thirdly, that those responsible for the outrage should be punished and finally, the United States wanted a guarantee that similar incidents would not again occur.

Mr. MacMurray's reply to the Second Additional Note of this agreement ends with the hopeful expression that:

> "To that end, the American Government looks forward to the hope that there may be developed an administration so far representative of the Chinese people, and so far exercising real authority, as to be capable of assuring the actual fulfilment in good faith of any obligations such as China would of necessity have for its part to undertake incidentally to the desired readjustment of treaty relations."

There was some criticism of Mr. MacMurray among foreigners in China, particularly in Hongkong newspapers, but subsequent events and the signing of identical treaties by all the Powers involved in the Nanking Incident indicated beyond a doubt that Mr. MacMurray's judgment, at the time, was wholly correct.

There can be little question but that the outstanding achievement of Mr. MacMurray's career was the negotiation and signing of the Soong-MacMurray Treaty providing for tariff autonomy with an interim period until all Powers agree to the same terms. The Soong-MacMurray Agreement is epoch-making because it broke the ice of diplomatic non-intercourse; it became possible for China to negotiate some 18 treaties on this and related subjects; it paved the way for the stabilization of the National Government by opening new sources of revenue. But more important still was the atmosphere engendered by the negotiations. Mr. T. V. Soong, Minister of Finance, was in Peking on other business, but sounded Mr. MacMurray on the possibility of a tariff treaty. It is no longer a secret that the discussion was more in the nature of a gentleman's after-dinner conversation. Mr. Soong and Mr. MacMurray found the maximum basis acceptable to both sides and proceeded to word their document so that there would a terse statement of fact without the usual diplomatic ambiguities. This agreement was signed during a moment of universal pessimism with regard to China; it was a gesture of sympathy, friendship and support in a critical hour. It will not readily be forgotten.

It is generally suggested, these days, that a Minister is usually a mere loud-speaker at the end of a cable wire. The circumstances surrounding the settlement of the Nanking Incident and the Soong-MacMurray Treaty are such that there can be no doubt whatsoever as to the significant rôle Mr. MacMurray played in bringing the negotiations with regard to them to fruition. In particular, the Soong-MacMurray Treaty must ever be regarded as a monument to Mr. MacMurray's friendship for China.

To those who have lived through the past five years in China, Mr. MacMurray's departure from the Legation in Peking will evoke regret and disappointment. He has served his country and its residents in China well; he has brought to China a continuous policy of sympathy and friendship from which he has never deviated.

The Kyoto Conference

By GEORGE BRONSON REA

It is perhaps premature to evaluate the effect on Pacific problems of the recent Conference of the Institute of Pacific Relations at Kyoto. Owing to the policy of excluding the press from its Round Table discussions, the public has to accept the Institute's own estimate of its efficiency and usefulness. There may be excellent reasons why the discussions of such an unofficial body which passes no resolutions should be held *in camera*, but whatever they are, they cannot be expected to appeal to the American newspaper mind. In fact, the proceedings at Kyoto were of such a secretive nature as to invite the suspicion that European conceptions of diplomacy and press censorship overruled the more liberal ideas of the American delegates. For general publicity purposes, the Manchurian issue was advertised as the big attraction of the Conference, but we would not be surprised later to learn that the Institute placed more emphasis on the subject of "Diplomatic Relations in the Pacific" and the general consensus of opinion arrived at during the discussions that the existing machinery of diplomacy in the Pacific is inadequate properly to handle the complicated problems.

In discussing this subject, it was pointed out that the existing machinery of Pacific diplomacy was confined to the Non-Fortification Agreements, the Four Power and the Nine Power Pacts, the Kellogg Pact, the League of Nations, various bi-lateral treaties and such unofficial organs as the Institute of Pacific Relations and the World Court.

By classifying itself as one of the main cogs in the wheels of Pacific diplomacy and then clamping down the lid on its discussions, the Institute fairly invites criticism of its program and policies, especially when the general opinion of the delegates is that some further machinery is urgently required to supplement the existing diplomatic organizations and that this might best be accomplished by making the League of Nations effective in the Pacific by the creation of some subsidiary regional organ of that body. In effect, the Kyoto Conference viewed from this angle, was for all practical purposes, a junior League debating society presided over by League enthusiasts, all hopeful of ultimately breaking down the barriers which have kept the United States officially on the outside while co-operating with it on many important problems. In the open forum on "Pacific Countries and the League of Nations," one of the leading American delegates stirred the assembly with a brilliant address in which he emphasized the part the United States was already taking in co-operating with the League.

What effect such discussions may have in influencing American sentiment towards joining the League remains to be seen, but there is little doubt that the conclusions reached at Kyoto will be intelligently and forcibly presented to the American public by a group of enthusiastic internationalists expert in formulating and guiding public opinion. How far American policies and interests in the Pacific will best be served by subordinating them to the League of Nations is a matter for discussion, but we can readily see where a clash may arise over matters that vitally concern the United States.

Up to the present, the Institute of Pacific Relations has confined itself to a study of the problems of Australia, Canada, China, Great Britain, Japan and the United States, but it is not difficult to look ahead to the time when, as the work of the Institute expands, immense pressure will be exerted to have India and the Latin American countries bordering on the Pacific, represented in the Institute and their problems brought up for discussion before the biennial conferences. Literature emanating from a Mexican publicist, having for its object the extension of the studies of the Institute to cover the Indo-Iberian countries of the Pacific, was officially distributed at Kyoto.

The success of such propaganda could result only in creating another international forum for discussing and battering down vital American policies and with the pronounced leaning of the Institute towards the League of Nations, its activities as far as the American public and government are concerned are certain to invite criticisms of its usefulness and objectives. For, it goes without saying, that should the Institute develop along these lines under the leadership of League advocates, America's Caribbean policy will be as bitterly assailed as was Japan's policy in

Manchuria at Kyoto. If an international organization created under the auspices of American idealists can in four years develop in importance to the point where it feels competent to discuss and determine once for all "who owns Manchuria," then it is also conceivable and entirely probable that in another few years it will be holding a conference in Mexico City, Panama, Lima or Santiago to decide who owns the Panama Canal or determine the validity of our treaties with Nicaragua.

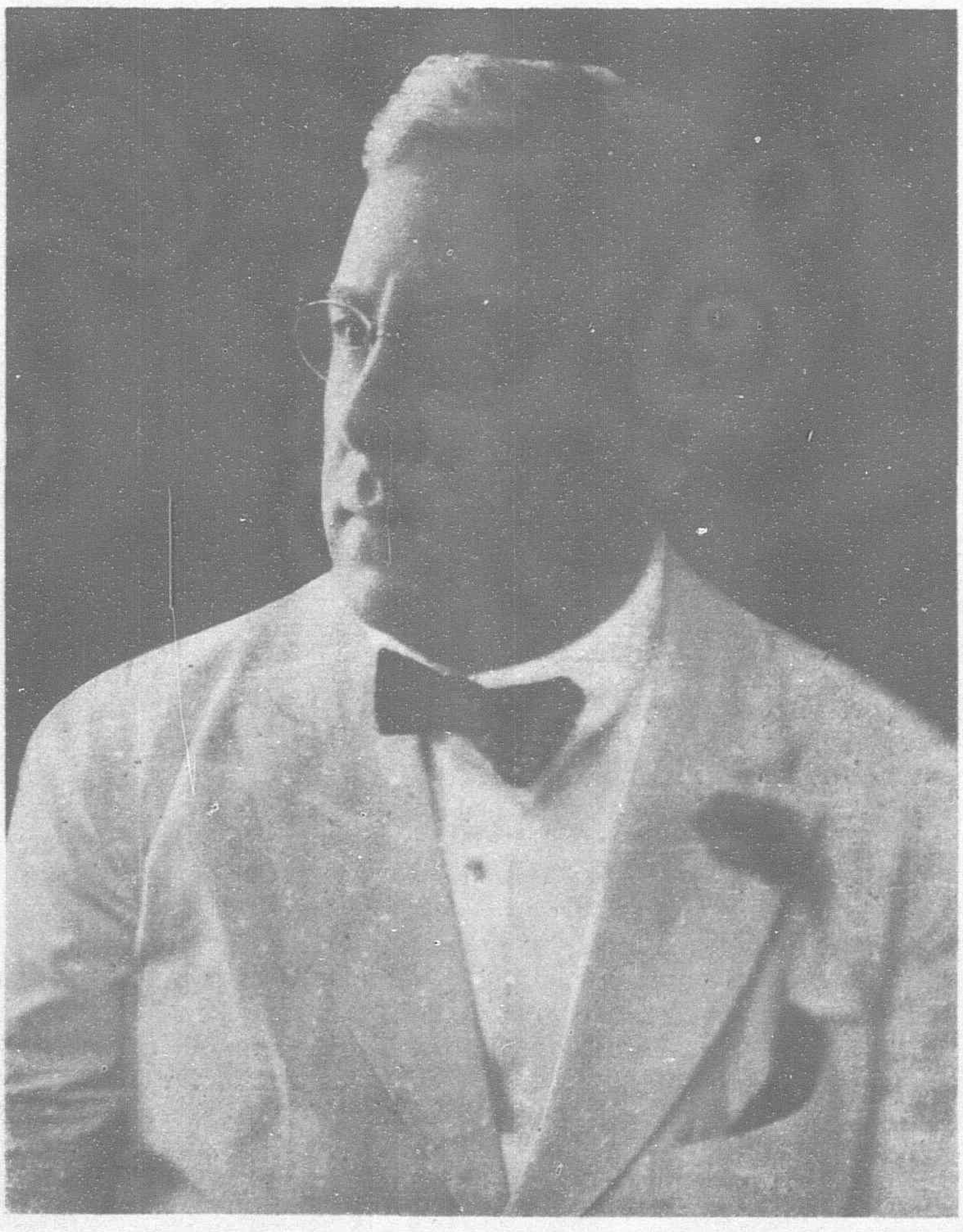
By the same reasoning which justifies the Institute in employing American experts to conduct exhaustive investigations in Manchuria, the Institute may be called upon to defray the costs of independent Japanese, British, or other researches into matters that vitally concern the security of the United States. Or, if the American Council should not feel disposed to encourage such interference in American affairs it would have no just cause for discouraging such investigations by others or could it interpose any objection to having their reports and findings circulated by the Institute as official propaganda. Public opinion in the United States would not feel kindly disposed toward any international organization, however well intentioned, that invited a free and open discussions as to the legality or validity of our canal rights in Panama or Nicaragua. That the Japanese welcomed an airing of their Manchurian difficulties is another proof of their traditional courtesy and an abiding faith in the justice of their position. But, if the Japanese should show such a profound interest in our Mexican problem or send their college professors and legal experts to Latin American or Caribbean countries to investigate and report on their differences with the "Colossus of the North," we would probably consider it as a piece of impertinence. It is hardly probable that the Japanese will ever presume to take advantage of the precedent created at Kyoto, but in evaluating the usefulness of the Conferences, this contingency must always be borne in mind. The Kyoto Conference may have been eminently successful from certain points of view, but unless we are greatly mistaken, the way is being unwittingly and insensibly prepared for reciprocal international meddling with equally important American policies.

As far as purely Eastern Asiatic problems are concerned, the creation of a regional or subsidiary League instrument to handle them, has much to commend it, though we balk at the suggestions advanced at the Conference that such an organ should be independent of and outside the League. This would mean the creation of a Pacific League which the United States must necessarily join and assume a leading part in, yet whose program and policies might not at all times harmonize with those laid down at Geneva. Whenever vital American interests became involved they would labor under the same handicap as exists in the major League, with four British votes to America's one and with the certainty that in many questions, China and Japan would also line up against us. Although there is much to be said in favor of such conferences, they have their disadvantages and limitations. They may even become a formidable obstacle to the solution of the very problems under consideration, unless experts representing all sides are permitted to present their facts. Otherwise, the conference might easily be stampeded by special pleaders into accepting and endorsing a given viewpoint.

For instance, it was highly dangerous for the Institute to start a discussion on "Extraterritoriality" and "Rendition of the Settlements" and fail to invite a representative of the foreign commercial interests in China to answer the arguments and statements of the Chinese delegates. Had it not been for the eleventh hour invitation extended to Mr. Stirling Fessenden, Director General of the Shanghai Municipal Council, the Chinese would undoubtedly have convinced the conference of the justice of their demands. Mr. Fessenden's expounding of the legal aspects of the problem, his intimate knowledge of current events and long connection with the Consular, Mixed and Chinese Courts, enabled him to present the foreign point of view in a convincing and masterly manner. Mr. Fessenden was unquestionably an outstanding personality at the Conference, one of the few experts who knew exactly what he was talking about. The Chinese emotional and sentimental appeal found a sympathetic reception amongst a group of delegates predisposed to favor their side of the case and it required considerable tact and a deep knowledge of the problem to expound the other side and change the current of thought. Foreign interests in Shanghai were fortunate indeed to have a champion and leader of the high qualifications possessed by Mr. Fessenden to defend their case before such a gathering.

The Kyoto Assembly took place at a time which once more emphasizes the futility of discussing Pacific problems unless Russia officially participates in such a conference. This oversight was the big mistake of the Washington Conference. In the undue haste to conform to post-war alignments and court the good-will of China by throwing Japan overboard, the Anglo-Japanese Alliance was discarded for an inocuous Four-Power Pact covering the Insular Possessions of the signatories in the Pacific. The Anglo-Japanese Alliance had stood for twenty years as the one guarantee of peace in the Far East; the one effective check to Russia's ambitious program of expansion in this part of the world. That alliance had teeth in it. Russia respected it. Once annulled, the road was opened for Russia to resume her advance without opposition. The Japanese were talked into surrendering their advantages gained as a result of the war and, as they receded before the force of world criticism, Russia sneaked back into her old position. The return of Russia to a dominant influence in Chinese affairs brought unrest, communism, revolution, chaos, anti-foreignism and demands for the abrogation of the treaties. Civil war, wholesale massacres, tortures, violations, murders, abductions and unspeakable horrors have been visited upon the peaceful Chinese people as the direct result of Russian intervention into their affairs. Only the presence of foreign war-ships and armed forces at Shanghai saved the foreign residents of the port from the fury of the victory-mad communist hordes. Had Japan been permitted to retain her position in Siberia and North Manchuria and settle her disputes with Russia without outside pressure, the course of events in China these past ten years would have been different. Pressure is again being brought to bear upon Japan for the purpose of influencing her to surrender her remaining rights in Manchuria. Once more Japan may be talked into receding and leaving the road open for another Russian advance. Are we to repeat the mistake of the Washington Conference?

With China and Russia in a state of war; with huge armies facing each other across the far-flung Siberia-Manchuria border-line, and the


Mr. Stirling Fessenden, Director-General, Shanghai Municipal Council

future of North Manchuria on the lap of the gods, the present is no time to discuss before an international gathering any further impairment or surrender of Japan's rights in Manchuria that will weaken her strategic position in that region. When the world has definite assurances from the Soviet of its intentions in Outer Mongolia and Northern Manchuria and responsible spokesmen for Russia attend such conferences, it will be time enough to scrutinize more carefully Japan's position. To omit Russia is like playing Hamlet with Hamlet left out. The Far East has paid dearly for leaving Russia out of the picture. It is rank folly, an invitation to further and certain disaster to discuss at this time the legality and validity of Japan's rights in South Manchuria or to bring pressure to bear from the outside to break down the one remaining barrier to Russia's domination of Northern China. Mongolia is lost to China, swallowed up in the congery of Soviet republics owing allegience to Moscow. Chinese Turkestan is rapidly travelling the same road. Yet with this picture clearly before us ; with "the menace from the direction of Urga" growing more and more formidable, a convention of idealists sits in Kyoto and calmly discusses whether or not Japan should get out of Manchuria. If the results of this conference should once more stir world opinion against Japan and she should be weak enough to hand over the South Manchuria Railway and the Kwantung Lease on the terms outlined by the Chinese, it is only a question of time before the Russo-Japanese war will have to be fought over again, the Kellogg Pact to the contrary notwithstanding.

Although the Kyoto Conference included "China's Finances" on its agenda, discussion was promptly squashed by delegates intimately connected with the Consortium Groups. Mr. Thomas W. Lamont's speech before the International Chamber of Commerce at Amsterdam in July and the concurrence of the Chinese banking delegates in his analysis of the situation, is the last word on this subject. However, the occasion provided an opportunity for one of the Chinese delegates to introduce a paper entitled "International Economic Co-operation in China" advocating the use of the League of Nations as the agency through which China could be placed upon her economic feet. This is the first time that any responsible Chinese has indicated a willingness to accept the services of the League in formulating and executing a practical plan for the economic development of the country. No large scale economic development of China is possible without foreign financial assistance and, as there exists a reluctance among Chinese statesmen to recognize the existing Consortium, the League of Nations may ultimately be called upon to carry out the above task. Although we are of the opinion that China is quite competent to finance her own railway and industrial development once internal conditions are stabilized, there are many productive enterprises and urgent transportation schemes that can only be realized by soliciting foreign financial aid. China would more willingly concede supervision over finances and other essential controls and guarantees to representatives of the League than to nationals of the Consortium countries. The Four Powers represented in the existing Consortium would undoubtedly welcome any extension of the principle of international co-operation in the financing of China to include the League of Nations, whose supervision is the best possible guarantee to the bond-holder that China's obligations will be faithfully met. Although it is premature to discuss any plan for financing the economic development of China, the expressed willingness to accept the services of the League is a decided step forwards towards a more perfect and harmonious solution to this problem.

One of the most serious subjects brought before the Conference for discussion and which received the least attention, was the use of "The Boycott as an Instrument of National Policy." Here was something that intimately affected the trade of every nation with China but as there was no representative of foreign chambers of commerce officially present, the Japanese case fell flat. It all depends on whose ox is being gored. Just now, the Japanese are feeling the effects of a nation-wide campaign in China against their commerce. Other nations are not immediately concerned. The Japanese delegate who introduced the subject in a brief but masterful memorandum, pointed out that during the past twenty years, China has on several occasions appealed to the boycott to support and enforce her diplomatic demands, until to-day it may fairly be said that China has renounced open warfare as an instrument of national policy in favor of the more silent but equally disastrous method of inflicting damage upon those nations who from time to time incur her ill-will. Although the boycott as an instrument of national policy has been resorted to by China more frequently in the past two decades in order to coerce or penalize Japan, it is well to recall that the weapon was first wielded by China in 1905 against American trade as a protest against the provisions of the new Sino-American Treaty. The boycott principle was also invoked in 1925 with disastrous effect upon British trade in order to penalize Great Britain for the May 30th incident. After inviting attention to the losses sustained by Japanese merchants as a result of the prolonged anti-Japanese agitations and boycotts in China, the Japanese spokesman cited several instances to prove the direct connection of the Nationalist Government with these movements. In concluding his remarks he voiced a sentiment that should merit the endorsement and support of every foreign chamber of commerce in China. "The continued application of the boycott as an instrument to settle international disputes is not only highly provocative and unjust in the light of accepted principles of international intercourse between friendly peoples, but, if war is to be condemned as an instrument of national policy, so also must the boycott be outlawed. Otherwise, perfect international peace can never be realized."

There can be no doubt that the boycott as applied by the Chinese is highly provocative. To resort to this weapon without first exhausting every other alternative to hostilities, through conciliation, arbitration or intervention by the League, is, for all practical purposes an act of war, just as destructive to the commerce of the boycotted nation as though its merchant vessels were sunk by the opponent's war-ships or shut off from entering its ports by an effective blockade.

The evidence submitted by the Japanese delegation clearly connected the Nationalist Government with these boycott movements and indicated that the anti-Japanese societies scattered throughout the country had been reorganized into a "National Association for the Accelleration of the Abrogation of the Unequal Treaties." If the Treaty Powers refuse to accept the unilateral cancellation of the treaties on January first, the threat is made that these organizations will again employ their peculiar methods to penalize foreign commerce by confiscating and destroying foreign goods until China's demands are met.

The Conference had a splendid opportunity to thresh out this question but the main fireworks were all over when it was raised. The delegates were all looking out the window admiring the autumn scenery at Kyoto. It did'nt interest them. If the Institute of Pacific Relations is to hold further conferences that covers every conceivable subject in the complex relations between China and other nations, it will be well advised to assure the attendance of experts representing the interests under discussion. If it insists on investigating commercial, financial, industrial and other activities that concern the interests of the foreign commercial community in China, courtesy demands that these interests be permitted an opportunity to state their case. Otherwise, these discussions are liable to do more harm than good.

The Kyoto Conference unquestionably had much to recommend it. It contributed in so small degree to a better understanding of many Pacific problems, but after all is said, the feature of the conference was Manchuria, the one issue that on its face can be solved only by an appeal to arms, the intervention of the World Court, or a readjustment of Japan's rights under a new treaty. It may be that such conferences promote international amity and create a better understanding of current problems, but as long as the benefits are confined to an exceedingly small group in each country, it is difficult to understand what value it all has in formulating an intelligent public opinion.

The discussion of international affairs by unofficial and officious organizations is being somewhat overdone. The success attending the Williamstown Institute of Politics has brought a score of imitators into the American field, all probing into delicate international and national problems. Wherever these discussions are open, the American press has been able to form its own estimate of their news value, and, if the subject was of sufficient importance, has conveyed the message to the public. For the Institute of Pacific Relations to hold a biennial pow-wow behind closed doors to discuss the most explosive issues of the Pacific and then hand out for publication a prepared statement of the proceedings, and expect to be taken seriously by the press, is a blunder, that if again repeated, may impair its usefulness.

(Continued on page 491).

Manchuria at the Kyoto Conference

By GEORGE BRONSON REA

Mr. Y. Matsuoka's Statement of Japan's Position in Manchuria Before the Kyoto Conference of the Institute of Pacific Relations, in Reply to the Chinese Delegate who Contended that China had to Pay Too High a Price for the Rights and Privileges Enjoyed by Japan in that Province.

"Had Japan known of the existence of the Secret Li-Lobanoff Treaty of Alliance of 1896 when the Portsmouth Peace Treaty was being negotiated, there would have been no South Manchuria problem to discuss to-day. Japan would have annexed the territory as part of the indemnity she would have imposed upon China for wilfully bringing about the war. Japan lost 100,000 men and spent two billion yen in the war with Russia. She is still paying interest on loans contracted to prosecute that war. The proofs are now before the world that China and Russia secretly entered into an offensive and defensive alliance directed against Japan, in which China handed over her territory for the construction of military railways to transport the Russian armies to strategic points on the frontier and ceded the Liaotung Peninsula in order to provide the Russian fleets with a warm water port on the Pacific.

"After occupying Manchuria with her armies and building a formidable naval base at Port Arthur, Russia betrayed her ally, annexed and created the territory into a viceroyalty ruled from St. Petersburg. China lost her sovereignty over this region. The Russo-Japanese war restored her sovereignty. That Manchuria is a part of China to-day is due entirely to the sacrifices of Japan. All that Japan received in return was the transfer of a railway road-bed or right of way and a short term lease to the Liaotung Peninsula. Japan borrowed the money from abroad and developed these rights until to-day the South Manchurian railway system is one of the most prosperous in the world. Manchuria is now the richest province in China, and the port at Dairen, second in importance to Shanghai.

"The Chinese contend that they have had to pay too great a price for Japan's rights in Manchuria. Is China willing to pay Japan for her sacrifice in 1905? If China is not willing to pay; is the cost of Manchuria too great when she is getting that territory for a sum of two billion yen less than nothing?"

IT was a foregone conclusion that in any serious discussion over Japan's rights in Manchuria, China would be confronted with the confession she made at Washington in 1921, when her delegates filed with the American Secretary of State the text of the secret Treaty of Alliance signed in May 1896 by Li Hung-chang and Prince Lobanoff. Manchuria was advertised as the main subject for discussion at Kyoto, but when it came to presenting their case, both Chinese and Japanese seemed to lose sight of the main issue. They talked all around it and flooded the Conference with papers, books and other literature covering all phases of the problem, except the basic issue. No reference was made by either side to The Twenty-one Demands or the 1915 Treaties. The legal aspects of the Manchurian problem were not touched on. It is not a difficult problem to understand or explain. Briefly, the whole controversy simmers down to the validity or invalidity of the 1915 Treaty.

The Chinese contend that this treaty was extracted under duress and was never ratified by the Chinese Parliament; therefore it is null and void. The Japanese stand squarely on the legality of the treaty and refuse to discuss it. The Chinese reserve the right to reopen the question on every opportune occasion.

If the Chinese contention is correct, Japan's rights in Manchuria are defined by the terms of the Portsmouth Peace Treaty and her occupation of the Liaotung Peninsula after the expiration of the original twenty-five year lease in 1923, is an act of aggression. But, if Japan is forced back upon the provisions of the Portsmouth Treaty, she will insist upon reopening the question as it stood at that date, and in the light of China's subsequent confession at Washington, will fall back on her position created by the Li-Lobanoff Secret Treaty of Alliance of 1896, which, on its face clearly convicts China of hostility and aggression against Japan. While standing on the legality of the 1915 treaty, Japan says, in effect, that if that treaty be declared null and void, she will demand the indemnity she was entitled to but was buncoed out of at Portsmouth by the profound secrecy surrounding the existence of China's alliance with Russia which made possible and precipitated the Russo-Japanese war. Or, even admitting that China was betrayed by her ally, Japan is still entitled to compensation for driving the Russians out of Manchuria and restoring China's sovereignty over a territory that by all recognized laws of warfare she had forfeited.

This, boiled down to its essentials, is the Manchuria problem as far as it concerns China and Japan, but it is futile to discuss it until the issues between China and Russia have been settled by Russia's withdrawal from North Manchuria and Outer Mongolia. To attempt to reach any solution of Sino-Japanese issues before Russian influence is withdrawn from the other regions, is like hitching the cart before the horse. The Manchurian problem is a three-cornered affair, embracing vital issues that do not concern any outside nation. There has been so much secret diplomacy, bribery and intrigue connected with the whole series of Manchurian treaties and agreements that no solution is now possible except complete readjustment under a new set of treaties.

Recent allegations and evidence that cannot lightly be ignored or set aside indicate that the original Manchurian Treaties and concessions were obtained by Russia from China by bribery and fraud. These statements accusing one of China's greatest statesmen of selling his country's birthright, has to date evoked no protest from any responsible Chinese source. This is all the more remarkable, as in any other country the publication of such direct charges would arouse a storm of public indignation and force the government to institute a searching inquiry into their truth or falsity. For, if such accusations are supported by evidence, the validity of the treaties in question would be impaired to the point where their repudiation would be imperative to uphold the honor of the nation.

The first of these direct charges was made by Count Witte, who frankly admits in his memoirs of having paid the sum of Taels 500,000 to Li Hung-chang and Taels 250,000 to Chang Yin-yuan to sign the South Manchuria Railway Agreement and the Liaotung Lease. When the Soviet subsequently published the secret archives of the Czarist régime, it released the actual text of the telegrams between Witte at St. Petersburg and Pokotiloff at Peking, which corroborate Witte's confession. The last telegram from Pokotiloff to Witte in the series concerning these negotiations reads:

> Peking, March 16/28, 1898; "I paid to-day to Li Hung-chang 500,000 Taels. Li Hung-chang is greatly pleased and requested me to convey his deep gratitude to you. At the same time I am wiring about it to Rothstein. I had no occasion to remit money to Chang Yin-yuan, who behaves with much caution."

There are also grave charges that Li Hung-chang received a huge bribe for signing the Master or Secret Treaty of Alliance of 1896 surrendering China's sovereignty in Manchuria. Sir Valentine Chirol, the foremost British authority on Asiatic affairs (for many years Foreign Editor of *The Times* of London) in his last book, "Fifty Years in a Changing World," after referring to Li Hung-chang's tour of Europe and America and his public speeches, says:

> "Few of his listeners would have then believed that his chief mission had already been fulfilled at St. Petersburg, where he was received by the Tsar and concluded a secret agreement with Russia for a consideration so substantial that the Empress Dowager, who had doubtless got word of it, kept him waiting outside Peking on his return to China until he had propitiated the Throne with a donation of £800,000."

Dr. Philip Joseph, whose book "Foreign Diplomacy in China, 1894-1900" is based on official British documents and other source material not hitherto available to other investigators, quotes from the unpublished Memoirs of Baron A. de Wolff, Vice-director of the Russian Foreign Office in 1896, the following;

> "The treaty settling this question was concluded in Moscow in 1896, at the time of the Coronation, with Li Hung-chang, the great man of China, who returned to Peking with the treaty signed and two million rubles in his pocket. Conscience in the East has its price."

Although the statement of Sir Valentine Chirol is probably based on second-hand information and therefore difficult to prove, the charges made by two of Russia's highest statesmen supported by the Russian state records, constitute evidence that at this late date may be difficult to set aside or refute. It is unfortunate for China that the above facts are brought to light after so many years, as the legitimacy of the treaties in question has been established by their continuous recognition on the part of successive Manchu and Militarist governments making them now binding upon the nation. On the other hand, the Nationalist authorities, constituting the first representative government of a united Chinese people, might contend with considerable force that the evidence justifying China's repudiation of the treaties has only recently been revealed and, that although nothing can now be done to undo the mistakes of the past, the facts as revealed constitute a powerful argument for the convocation of a Tripartite Conference to readjust the rights of Russia and Japan under the terms of a new and cleaner understanding.

No permanent or peaceful solution of the Manchurian problem is possible as long as Russia controls or participates in the operation of the Chinese Eastern Railway, for the simple reason that as long as the Soviet is installed in North Manchuria and includes Mongolia in its system of Communist republics, Japan will justify the presence of her troops in the southern half of the province in order to defend her strategic position and commercial rights against this menace. Once the Chinese Eastern Railway comes under the sole operating direction and protection of China, the Russian menace largely disappears and the way is opened for China to enter into some new agreement defining Japan's position and rights.

The Soviet has damned its own case by the publication of the Czarist records; a legal confession that Russia's original rights in Manchuria were obtained by trickery. It is a remarkable paradox that although Moscow has denounced all other Czarist obligations, it demands compliance on the part of China with the one treaty its own records prove was invalid. Repudiating all other Czarist treaties while insisting upon the continuity and observance of an infamous and perfidious agreement signed at the cost of China's honor, sovereignty and territorial integrity, convicts the Soviet of cynical dishonesty, tortuous diplomacy and vicious aggression against a nation it considers too weak to assert or defend its rights. The history of imperialism in its most flagrant forms, cannot equal this callous disregard of principles which the Soviet employs to repudiate its honorable obligations to other nations. In this incident, we have the picture of a communist state appealing to capitalist principles in order to preserve its control over a property created with funds borrowed from France, a debt it refuses to acknowledge or repay.

Mr. Y. Matsuoka, Formerly of the South Manchuria Railway

The larger and more dangerous issue with Japan can never be solved until the Chinese Eastern question is settled. Japan acquired her rights in Manchuria as the price of her victory over Russia in 1905. In 1915, Japan presented certain demands upon China, as a result of which, the Chinese Government signed a treaty extending the South Manchuria Railway rights and the Liaotung Lease to 99 years. This treaty is all that remains of the Twenty-one Demands. China now insists that the 1915 treaty is invalid because it was signed under duress and reserves her right to open the question at every opportune moment. China has declared that she will never recognize this treaty. Japan stands squarely upon its validity and declines to discuss the matter with China or permit any outside nation to interfere or mediate in the quarrel.

Although it has been openly stated by Chinese authorities and corroborated by Viscount Kato in a press interview, that Japan's ultimatum to China was invited by Yuan Shih-kai to save his face with the Chinese people; that the leniency of the ultimatum chagrined and astonished the Chinese statesmen in charge of the negotiations; that they had already conceded far more than the ultimatum called for; that the

Twenty-one Demands were a put-up job, part of a cut and dried understanding between Yuan and Okuma; world opinion will sympathize with China in refusing to recognize a treaty that stands in the estimation of the Chinese, as a record of their humiliation. If, as the late Dr. Sun Yat-sen repeatedly asserted to his confidants, the Twenty-one Demands was the price Yuan Shih-kai was willing to pay Japan for recognizing him as Emperor, and his associates now living are in possession of the proofs to substantiate this statement, then the honor of both China and Japan is involved to an extent calls for something more than a mere perfunctory official denial. If the above facts are true, then the humiliation visited upon China was of her own seeking, a betrayal of the nation in the interests of an individual. In this instance, it is the Chinese themselves who charge their own ruler with treason. The Japanese have refrained from making any comment on the origins of the Twenty-one Demands, except to confirm the statement that the ultimatum was presented at the express solicitation of Yuan Shih-kai. They stand upon the legality and validity of the treaty signed as the outcome of these demands. China's case for its repudiation would be immeasurably strengthened if her statesmen can prove even at this late date, that Yuan betrayed the nation to further his personal ambitions.

Even if China's contention that the 1915 treaty is invalid be upheld, it throws the whole question of Japan's rights in Manchuria back to Portsmouth, and as Mr. Matsuoka very clearly pointed out at the Kyoto Conference, China must then be prepared to meet Japan's demand for the indemnity that she would have exacted at Portsmouth had the existence of the secret 1896 treaty of alliance between China and Russia been known at that time. If China continues to raise the question of Japan's rights in Manchuria at every opportune moment and foments agitations and boycotts to support her side of the case, sooner or later some incident will occur to precipitate a crisis, that will plunge both nations into hostilities or force the issue into the World Court. In that event, if China rests her case on the invalidity of the 1915 treaties, Japan will confront China with her confession at Washington and demand a reopening of the whole dispute based on this new evidence and demand the indemnity that she would have imposed upon her had the truth been known at Portsmouth.

Recent utterances of Japanese statesmen indicate that they will welcome any solution that will establish Japan's relations with China on a permanent and friendly basis. Japan has repeatedly assured the world of her intention to respect the sovereignty of China in Manchuria, insisting only that her legal rights acquired under the 1915 and other conventions be respected. If the Russian menace be removed from North Manchuria, and Chinese troops can maintain the peace of the province and protect foreign lives and properties against the bandits who roam the Manchurian plains, Japan might then be willing to withdraw her railway guards and operate the South Manchurian Railway as a purely commercial enterprise.

Japan's justification of her position in demanding compliance with the terms of the 1915 treaty and declining to discuss the matter further with China or permit the interference of any outside power in the dispute, is simply that no useful purpose can be served by digging up old issues. No matter from what angle the problem is approached, Japan considers that she is justly entitled to hold what she has. If China refuses to abide by the 1915 treaty and insists upon opening the grave, Japan, in self defence, will go back to Portsmouth, confront the Chinese with their confession that now reposes in the archives of the State Department and recede upon her position created by the secret Sino-Russian treaty of alliance of May, 1896, which convicts China of premeditated aggression and hostility against Japan. Whether her rights to the South Manchuria Railway and the Liaotung Lease are determined by the 1915 treaty or by a new agreement based on China's alliance with Russia seems to be immaterial to Japan. The result as far as Japan is concerned, is the same. Or, even if China's liability under the terms of the alliance be waived, Japan feels that she is entitled to adequate compensation for restoring China's sovereignty over a territory that had been annexed by Russia. China's rejection of the 1915 treaty therefore only opens old sores, which Japan feels is unnecessary.

China's diplomats, after filing the text of the secret treaty of alliance with the State Department, take the stand that it is a closed incident; contending that Russia's failure to respect the sovereignty of China in 1900 automatically invalidated it long before the Russo-Japanese war. In other words, from the Chinese viewpoint, both the 1915 and the 1896 treaties are invalid. China simply rejects all responsibility for the events that followed after 1896. But it is difficult to evade or set aside the evidence of history or the fact that the alliance did its work. The railway and the alliance can not be considered apart. Li Ching-mai, the son of Li Hung-chang, when Chinese Minister at London in 1910, disclosed the terms of the alliance, and in defending his father, said that the defensive alliance was the peg on which he hung the railway concession.

"China will give Russia the use of its territory to build the railway on, and will also confer special rights of management on the railway company, but only as integral parts of a comprehensive treaty of defense. The railway concession shall be the corollary of the defensive alliance, and China shall mete it out ungrudgingly. China will allow Russia the use of her land, Russia guarantees us the integrity of our Empire. That was the compact and in that compact is included China's motive for the concession."

That Russia callously betrayed her Ally in annexing the three Manchurian provinces and closing them to world trade, strengthens the contention of the Chinese that the alliance was automatically invalidated by Russia's treachery. On the other hand, this argument is vitiated by the fact that the Manchus never denounced the treaty or admitted its existence. The main object of the alliance was to humiliate Japan and to achieve this, Li Hung-chang waived all other concepts of honor and patriotism.

Japanese statesmen declare that China faithfully fulfilled her part of the bargain when she signed the railway conventions and the Liaotung Lease, surrendering her sovereignty over the railway zone and the warm-water port in order that the Russian army and navy could do the actual fighting. Russia may have invalidated the treaty but its vital provisions had been carried out. The damage was already done. Japan had no other course but to fight for her existence. It is quite true, as the Chinese contend, that Japan did not go to war to save or benefit China. She fought her own battle, but in doing so, she also saved Manchuria and North China from passing under the rule of the Muscovite. The war could never have been fought; there would never have been any provocation or necessity for Japan to stake her national existence had it not been for the presence of the Russian armies in Manchuria and fleets at Port Arthur. These armies and fleets were introduced into Manchuria for the sole purpose of waging war upon Japan. The Chinese, after opening their doors to their Ally to get into a position to fight Japan, reject any further responsibility for what followed.

If there is to be any peaceful solution to the Manchurian problem, it can come only from a recognition on the part of China of the events of history. That is the only interpretation that can be given to the statement of the Japanese spokesman at Kyoto. How far is China willing to compensate Japan for the sacrifices forced upon her by the operation of the Li-Lobanoff Secret Treaty of Alliance? Is China willing to exchange the 1915 Treaty for one that concedes the same rights to Japan as partial compensation for her losses of 1905? If China is willing to recognize her responsibility for the events following 1896 and compensate Japan for restoring her lost sovereignty over Manchuria, there is no good reason why the 1915 Treaty should not be scrapped. If Japan's rights in Manchuria can be adjusted on some such basis, the road is open for a firm and lasting friendship between the two great Asiatic nations. Only along some such lines can the Manchurian problem be peacefully and permanently solved. The time may not be opportune, but as the clouds clear, some interested statesman, whether Chinese, Russian or Japanese, should take the initiative in inviting a Tripartite Conference to discuss and find such a solution based on an entirely new set of treaties. Public opinion throughout the world will never tolerate another war that can be avoided by pacific means.

EAST ASIATIC CO.'S PASSENGER SHIPS.—The three passenger and cargo ships which the East Asiatic Co. are building for their service between the North Pacific and Europe will have accommodation for 71 passengers, and there will be about 70,000 cubic ft. of cold storage space. They are 442-ft. long and will be equipped with twin-screw four-stroke single-acting Burmeister and Wain machinery of 6,000 i.h.p. to give a service speed of 14 knots. They will reach North Pacific ports from Northern European ports in about 23 days. The first vessel will arrive at San Francisco next January, and the second a month or two later.—*The Motor Ship.*

Japan and Naval Conference

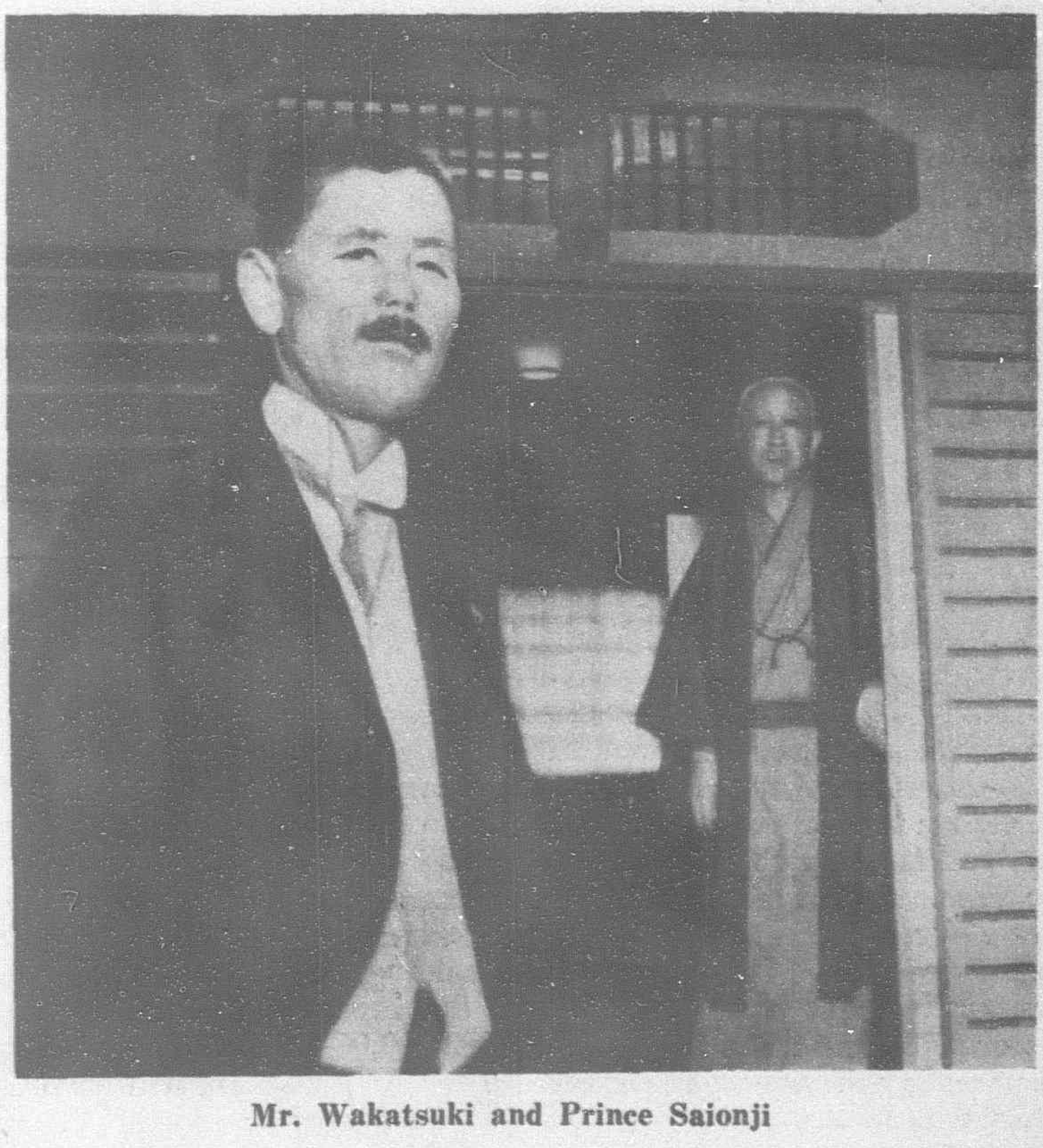
What She Secretly Hopes to Accomplish

By K. Sato

Japan attended the Washington Conference with the curious diffidence of a penitent; she participated in the Geneva Conference with the hopeful indecision of an opportunist; what is her attitude in the coming London Conference?

Mr Wakatsuki followed by a coterie of naval and diplomatic experts will leave Japan on November 30. His ultimate destination is London where he will, for the first time in his life, try a diplomatic task as the supreme head of the Japanese Delegation. Though we all know his caliber as a politician, no one—including himself—has any idea as to his talent in diplomacy. His success in public life has been due to his abundant possession of those elements which are not supposed to be necessary qualification for successful politicians. In Japan, as in other countries, only those men who have ability for organization, coupled with great personal magnetism, climb to the top in party affairs. There are traits which Mr. Wakatsuki does not have in any marked degree; but he is endowed with an extraordinary capacity for clear thinking together with a highly susceptible and keen nature.

On his way to London, Mr. Wakatsuki will stop about a week in Washington. In a recent interview with the press representatives, he ostensibly declared that his contemplated visit to the American capital is for no other purpose except to pay homage to the White House. His laconic denial of what is obvious throws some light upon the character of the man—for it is understood that he is requested to try an overture on the Washington stage. It may be recalled that the British Government in its invitation has laid much stress upon the desirability of arriving at preliminary accord in more salient features of the negotiations. It stated in part: "In the same way as the two Governments (those of Britain and America) have kept Your Excellency informally *au courant* of the recent discussion, so now His Majesty's Government will be willing, in the interval before the proposed conference, to continue informal conversations with Your Excellency on any points which may require elucidation." Japan had already been envious of the exclusive negotiations conducted between Britain and the United States; she would not, accordingly, fail to avail herself of the opportunity thus formally offered for tête-à-tête conversations.



Mr. Wakatsuki and Prince Saionji

Of course the government did not wait the opening of such conversations until Mr. Wakatsuki gets to Washington and London. The Japanese believe in the old strategical principle; "To have taken precedence is to have half defeated your enemies." Ambassador Debuchi, a versatile and congenial personality, who had succeeded former Ambassador Matsudaira at Washington, immediately commenced preliminary talks with the American Secretary of State Stimson, who by the way, has been appointed to lead the American Delegation in London. It is understood that his chief diplomatic efforts have consisted in obtaining some sort of American consent—or at least encouraging hope—for Japan's aspiration to get a ratio of 7 for America's 10 in auxiliary craft. Of course the point is brought forward somewhat in the nature of a persuasion in connection with other considerations which will have the effect of softening the force of insistence. The State Department, however, displayed an unconciliatory attitude in the matter of the ratio on various grounds. For one thing, it fears that a concession to the Japanese claim might shake the ground of the capital ship ratio which was laid down in the Washington Conference and which is fixed at 6 for Japan to America's 10. Then it cannot ignore public sentiment, and especially the feeling of the Senate, which is in obvious opposition to the Japanese demand.

One means of alleviating the American opposition consists in obtaining a favorable response from the British Government. Although the Anglo-Japanese Alliance was buried at Washington in 1922, probably from force of its former momentum, there has persisted a sort of mutual trust between the old allies. A trusted friendship together with the absence of contingencies calling for naval rivalries enables them to be mutually magnanimous towards each other's peculiar requests in naval armament. An appeal to British sympathy is thus the line of least resistance, and the Japanese Government would have started informal talks with it much earlier had it not been for the absence of Premier MacDonald on his American visit. He returned at the early part of November, but accumulated affairs of State claimed his entire attention for about a week: it was only on the 11th of November that Ambassador Matsudaira could get him to begin conversations.

It has been reported that upon having listened to the Ambassador's presentation of Japan's claims the British Premier has promised to give them the best consideration. What, then, will be the possible decision of the British Government? By the time the present article is published this shall have become clear; at the present moment we can but conjecture.

As far as Britain is concerned, we imagine that naval relations with America are of paramount importance and that a proposition for a slight alteration in the Japanese ratio may not be considered as a matter of serious concern. Mr. MacDonald will accordingly be sympathetically disposed towards Japan's earnest appeal and may wish to have her request granted; only, the question is how far he is willing to exercise his influence in bringing the American Government into line with his sentiment. Should he learn—as in all probability he will, in time—that American opposition against the Japanese ratio proposal is irreconcilably strong, it is feared that he would not insist upon the point, even at the price of jeopardizing the Anglo-American accord so dearly obtained. And we have every reason to expect that Washington will not make any concession on the Japanese ratio just because Britain magnanimously acknowledges it, or because Mr. MacDonald wishes that America generously approve of it. With America the matter is more seriously considered than permits of such easy disposition.

Inasmuch as Japan is in deadly earnest in her demand for a higher ratio in auxiliary craft, especially for a larger cruiser force, it is to be expected that if America persist in adament opposition, the contemplated conference may prove an exceedingly stormy one. Should the matter be thrashed out in the conference, it is plain that in point of argument America will be outdone by the Japanese. In Washington Japan yielded to a ratio of 5-5-3 in capital ships, not indeed without long debate and extreme reluctance. But, to-day, America can hardly seize upon any plausible pretext to enforce the same ratio in auxiliary craft, except on a ground that it had been applied on capital ships. Japan will point out against it that at Washington on the occasion of yielding to the capital ship ratio, she explicitly stated that this did not mean that she would accept a similar ratio in other types of vessels. Further, Japan will argue that, in the very criterion which was used in deciding the capital ship ratio, namely, in existing power, Japan to-day has in command a force in auxiliary craft which is at least equivalent to 7 for America's 10. (For exact calculation of relative strengths see appendix). In Washington, it may be recalled, Japan stressed various national circumstances, such as long coast lines, large population, peculiar exposure to maritime attack, being an island empire, etc. as grounds for allowing her a relatively larger ratio. All these arguments were turned down, and the simple and precise index of existing forces was seized on as the effective "yardstick." It is on this same ground that Japan now demands a ratio of 7 in cruiser forces.

With America, however, it is a matter of sentiment and not of reason. She will oppose it no matter what is the vindictiveness of argument urged. In international negotiations it is not vindictiveness of argument that always prevails; it is the will of the stronger which oftener preponderates. But Japan is really in earnest about her demand in the new ratio. Herein lies a great danger of the coming London Conference encountering a serious impasse, unless some reasonable understanding be reached in course of preliminary negotiations. The task of coaxing the American statesmen to come to meet the Japanese demand more than half way naturally devolves upon Mr. Wakatsuki, now that Ambassador Debuchi has shown his inability to do so himself. Although he himself denies any such intention, it is as good as understood that Mr. Wakatsuki will stay at Washington for at least a week—or possibly longer since the date of the conference is now postponed until January 21, 1930—and try his best to pave the way for harmonious unison at the conference table.

Will he succeed in the difficult commission? One pertinent fact we should remember is that the American Government is almost as eager as Japan to materialize the proposed naval curtailment, although from slightly different motives. President Hoover is a practical pacifist who wishes to have the world made safe for business. To such a mentality international rivalry in naval armament is no fun—it costs too much money without any positive compensatory value. The American people as a whole also amply share the pragmatic sentiment of the president. They are rich and hence can afford to expend billions for negative purposes if they must, but at heart they do not welcome such dissipation. They would much rather save the money and invest it in remunerative fields. Thus while it is not impossible to arouse public sentiment by patriotic appeal to the approval of a large naval building program, it is rather the cutting of naval forces through international agreement, which the American public would appraise as a stroke of wise statesmanship. It was owing to this psychology that Mr. Charles Hughes received a tremendous national acclamation upon successful conclusion of the Washington Conference.

Consideration of this fact is the greatest source of encouragement for the Japanese aspiration of a higher ratio. Considering the magnitude of consequence to follow if the next conference breaks up in failure, America will not so hastily and simply reject the Japanese plea if she learns of Japan's deadly seriousness about it. One may imagine that inasmuch as her primary object is naval parity with Great Britain, America would not hesitate to let the conference fail provided the Anglo-American naval agreement be upheld. That, however, is to depreciate the American concern over the Japanese navy, which is the precise reason for her adamant refusal of the proposed ratio. What in the end is likely to follow would be some sort of a reciprocal compromise. Japan may propose to moderate her ratio claim to 6.5 instead 7 provided in this concession she may be compensated for by some other favors. It is not certain what she would ask; it may be a demand for absolute parity with Britain and America in submarines or some further restriction on Pacific fortifications, or still another, perhaps even more important than any, from Japanese viewpoint.

Earnest as Japan is about the ratio, she is even more earnest about a substantial reduction of naval forces. Although she is not particularly anxious to admit it, she is in fact not in a position, financially, to keep pace with incomparably mightier nations like America and Britain in the costly race of naval expansion. The World War brought to Japan an unlooked for economic boom; the insatiable demand from Europe for all sorts of Japanese goods caused a sudden growth of her industry and business. By one stroke Japan became a great and wealthy industrial country. But Japanese business men were short-sighted; they lacked the foresight to prepare for the economic catastrophe which followed the close of the war. One after another great mercantile houses having branches all over the world succumbed to the roaring tide of crises and it seemed that net gain of the war-time prosperity amounted after all to a new habit of extravagance without any additional resources. Then came the earthquake reducing the capital and its vicinity actually to heaps of ashes, incurring a loss of a third of the nation's wealth. Ever since this cruel disaster Japan has remained economically a crippled nation, suffering from an internal wound that rankles intermittently.

The series of reverses has not given Japan an opportunity to carry out a measure which she should have long ago carried out. Of all the leading nations in the world Japan alone has tarried to lift the gold embargo and thereby to establish her international credit upon a normal gold specie basis. The abnormal situation has placed Japan in a state of financial instability due primarily to the ceaseless fluctuation of the Yen's exchange value, which was subjected entirely to the mercy of speculators. Mr. Hamaguchi, himself an experienced financier, organized his Ministry with the express purpose of accomplishing what sooner or later must be accomplished even at a great sacrifice—to lift the gold ban. Since then it has been the foremost pre-occupation of the Ministry to make every preparation towards a prompt fulfilment of the object and towards minimizing any adverse effect to be caused upon the country's economic mechanism. To this end Mr. Hamaguchi has launched a campaign of nation-wide thrift exemplifying it by an administrative policy of radical retrenchment. The government not only turned down almost all new public enterprises proposed, but it even ordered a temporary cessation of numerous public works already greatly advanced. It has drafted a budget for the next year, in which a net reduction of Y.165,000,000 in national expenditure is enforced from the budget of the preceding year. The reduction was effected by a substantial abridgement of military strength (it is proposed to abolish 14 infantry regiments and to reduce materially the unit of cavalry regiments, army serivce corps and engineer corps) and by definite economy in enterprises of every department of the government. The administration has gone a step further and proposed to cut the salary of the state officials by an average of ten per cent., but the plan met with the stubborn opposition of public opinion and it was finally dropped. Thanks to the earnest efforts of the government in co-operation with the people, the exchange rate of the national currency has remarkably improved (at the time of writing it stood at $48.80 for Y.100.) and other circumstances point to the steady approach of the day when Japan may resume a normal course of economic relationship.

Such in short is the financial state of the country on the eve of participation in the coming London Conference. Japan's utmost concern it certainly is to have her financial burden accruing from naval rivalry substantially relieved. She has been contemplating the Anglo-American talks on naval parity with great alarm, because if the informal agreement said to have been reached shall stand, it will result in the inevitable building of more ships to her as well as to Britain and America. It may be recalled that the negotiation envisages that America should get 21 cruisers of 10,000 tons each armed with 8-inch guns in addition to 10 cruisers of the Omaha type and 5 cruisers mounting 6-inch guns making a total of 36 cruisers with a tonnage of 315,000. Britain on the other hand is to have 15 cruisers with 8-inch guns, 35 cruisers with 6-inch guns making a total of 50 cruisers with a tonnage of 339,000. This means that America should build 11 new cruisers of 10,000 ton size, 5 cruisers of 7,000 ton size, or a total tonnage of 145,000 tons the building cost of which would reach roughly to $250,000,000. Britain will have to build 14 cruisers of the Hawkin's type at a cost of £25,000,000. Japan, too, if she is to get her desired ratio of 7 for America's 10, will have to build 4 cruisers of 10,000 ton size at an aggregate cost of Y.160.000.000. This is naval expansion pure and simple, and not naval reduction! Japan for one will not, and cannot, tolerate such an anomaly. It is understood that she will make a strong protest if the Anglo-American parity in the form already published assumes the semblance of materialization. She will, on the other hand exert her utmost influence to prevail on others to agree on drastic naval reduction.

An interesting object of speculation under the circumstance would be how far Japan is prepared to subordinate her ratio claim to her all important point of decisive reduction. Needless to say that she wishes to get both if possible: with these double objects in view her delegates will fight in the preliminary talks as well as in the conference. But suppose she will have to surrender either one, what will she do? The ratio question has a touch of egoism, the insistence on reduction has a guise of altruism. It is up to Mr. Wakatsuki to use his best tactics to get the most for the least sacrifice—in such a matter he is adopt enough. But if in spite of clever strategy Japan had to give up either one of the two demands, which would she sacrifice? Without doubt the ratio. That is to say that Japan will not walk out of the conference even if, through American opposition, her ratio claim creates a deadlock. For Japan would consider that if she can get any material reduction of her naval expenditure through the conference, she has still good reasons to regard it to have been highly fruitful, if not perfectly successful. Japan attends the London Conference, then, with a spirit of mutual conciliation and accommodation; the peculiar national predicament in which she finds herself does not warrant of any other course.

APPENDIX:

Comparative Naval Strength Japan, U.S. and Britain

Compiled from Official Sources

VESSELS	JAPAN		AMERICA		BRITAIN	
	No.	Tonnage	No.	Tonnage	No.	Tonnage
Cruisers with 8-inch guns:						
In commission	8	68,400	1	10,000	15	148,400
Building	4	40,000	7	70,000	4	36,800
Planned	—	—	15	150,000	3	30,000
Total	12	108,400	23	230,000	22	215,200
Smaller cruisers with 6-in. guns:						
In commission	21	98,415	10	70,500	41	189,545
Building	—	—	—	—	—	—
Planned	—	—	—	—	2	13,000
Total	21	98,415	10	70,500	43	202,545
Destroyers:						
Total	119	132,495	262	268,730	183	196,710
Submarines:						
Total	71	78,497	123	87,313	76	79,362

It may be noted that in the important category of large cruisers, exclusive of vessels planned, Japan has 108,400 tons for America's 80,000 tons and Britain's 185,200 tons.

In smaller cruisers Japan's possession exceeds America's by nearly 30,000 tons and Britain has Japan's double.

In destroyers Japan has half of American possession and Britain stands at middle point between the two.

In submarine the respective possession of the three Powers shows only a small difference.

(Only those cruisers which are under the age of two years are included in the table. In case of destroyers the age limit is 16 years; in submarines it is 13 years.)

The Kyoto Conference

(Continued from page 485).

These conferences are of great help towards cementing international friendships, but the Rotarians, Kiwanis Clubs, Y.M.C.A., Y.W.C.A. and other groupings of congenial spirits accomplish the same purpose. The recent meeting of the International Chamber of Commerce at Amsterdam brought the businessmen and bankers of China into touch with world realities and provided the proper occasion to discuss one of the most important problems confronting international finance. The 1928 session of the Williamstown Institute of Politics accomplished more towards clarifying the Manchurian situation than any other gathering since the Washington Conference. There, in an open forum for all the world to hear, the Chinese Minister to Washington and Japan's Consul General at New York, officially stated their respective sides of the controversy and every word was faithfully communicated to the public by an intelligent and appreciative press.

The secretive Kyoto proceedings failed to add anything to the world's knowledge about the basic Manchurian problem or change in any way the official position as laid down at the Washington Conference, and emphasized at Williamstown. The Kyoto Conference however stressed one important point. It brought forth Japan's final answer to China on Manchuria. Blunt, indirect, unofficial and without binding force, Mr. Matsuoka's rejoinder to Dr. Hsu Shu-hai was as much an official pronouncement of Japan's irreducible minimum for the solution of the Manchurian problem as though it emanated from the highest official spokesman for the Empire.

It is unlikely that the message of Japan contained in that rejoinder will ever be communicated to the Chinese people. We doubt if it will receive notice or editorial discussion in any Chinese newspaper. It will never be referred to by the Chinese educators in the class rooms of their colleges. In their superior way, the Chinese will ignore it and any reference to it will be denounced as Japanese propaganda. The Chinese will continue their boycotts, agitations and "direct action" to compel Japan to accept their viewpoint, until some incident precipitates a show-down. If the Kyoto Conference succeeds, even in a small way, in educating Chinese public opinion to the realities of the situation and a better understanding and appreciation of Japan's position, and paves the way for more dispassionate discussion of facts, that will eventually lead to an amicable settlement of the dispute, the Institute of Pacific Relations will have justified its existence and further usefulness.

The Kowloon-Canton Railway

The Kowloon-Canton Railway (British Section) had a very successful year during 1928. Since the adoption of the new system of accounts, its revenues, for the first time, shewed an excess over working expenses. The accounts showed a balance net revenue of $20,040.73. This figure would be considerably augmented were the transport of government passengers and rent of railway quarters to be included, and the Russian Rails written down not charged to working expenses. The total net revenue amounted to $59,416.07.

Negotiations regarding the acquisition of three new special locomotives for hauling the through express trains were continued with the Chinese Section, but a final decision as to the purchase has not as yet been reached.

On the engineering side, the only new works of significance were in connection with improvement to Taipo Market Station providing for a proper passenger platform, a goods siding and dock, and the use of the loop line for all stopping trains. The work was completed and the new arrangements brought into use by the end of 1928.

The concrete sleeper depôt made 5,070 reinforced concrete sleepers and 35 reinforced concrete kilometre posts for the use of the Railway during the year. Reinforced concrete slabs were laid on the gantries of Bridges Nos. 10, 25 and 33 in substitution of wooden planks. The overhead bridge at Gascoigne Road, the foot-bridge at Holt's Crossing, Bridge No. 30 at Taipo and the steelwork of Taipo Pier were scraped and painted. The reinforced concrete wharf at Kowloon Station which was twice damaged by the collision by launches, were duly repaired.

An accommodation road bridge of 28 feet span was found necessary at Mile 15¾. Work was commenced in November, 1928, and will be completed in 1929.

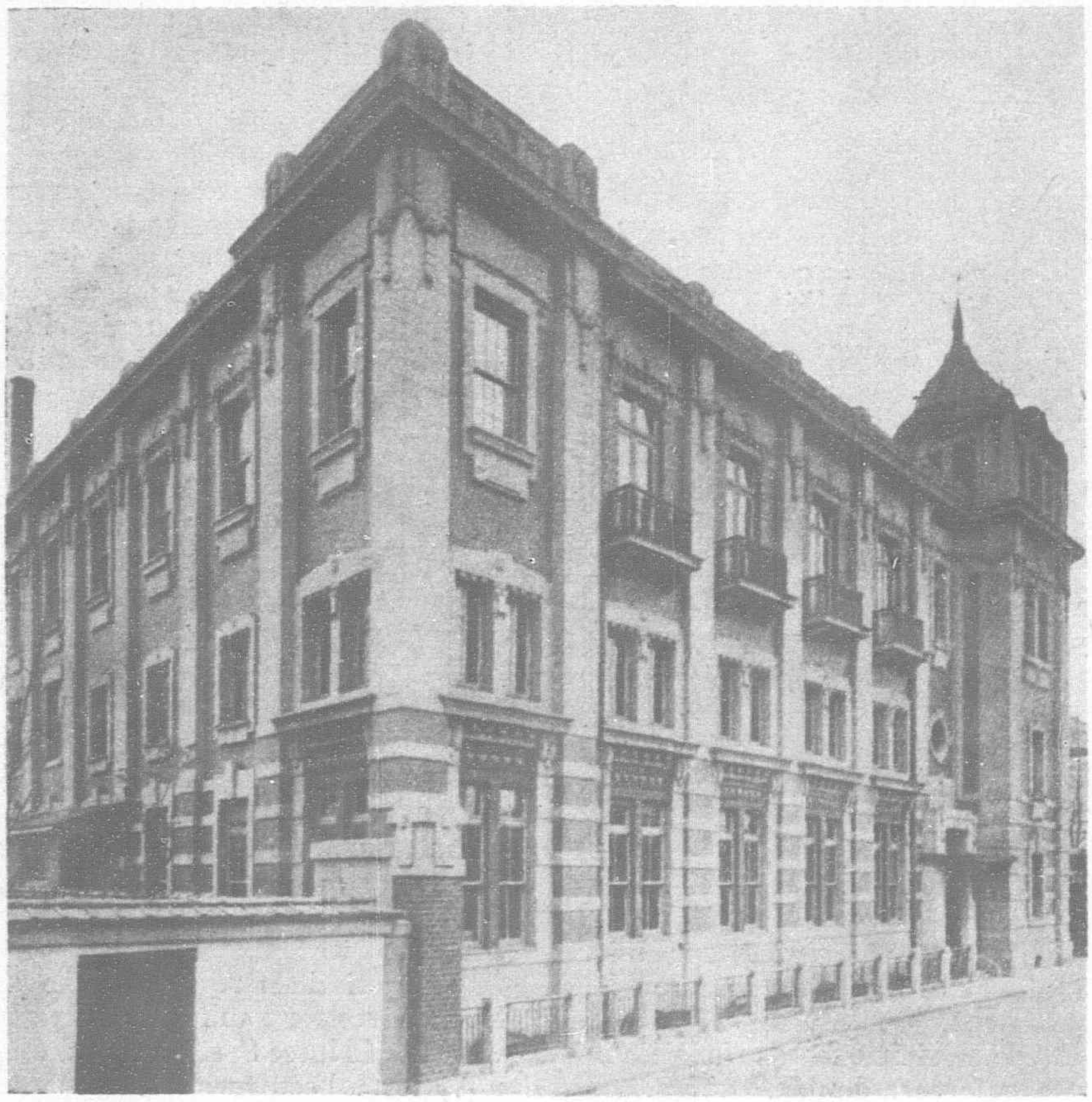
The principal item of track maintenance involved the relaying of Beacon Hill Tunnel (2,403 yards) with new 85-lb. flat-bottomed rails, found necessary, owing to a number of rail breakages suddenly occurring. There appears to be an abnormal amount of rail wear in this tunnel on account of the severe grades and damp patches.

Abolition of All-Night Work in Japan

New Phase of Development for Cotton Spinning Industry

By EISABURO KUSANO

Two hundred thousand women and juvenile factory operatives engaged in various kinds of all-night work in Japan were set free from their midnight toil on July 1, 1929, by virtue of the revised Factory Law. This fact marked the opening of a new phase in the development of the cotton spinning industry in this country, which is one of the most important as well as prosperous enterprises in which well over Y.550,000,000 is invested. In view of the fact that up to 74 per cent. of the factory operatives coming under the protection of the revised factory Law were in the employ of the cotton spinning companies, the abolition of the work between 11 p.m. and 5 a.m. necessarily signified a remarkable change in the working conditions; the effect of the measure was so important that it was considered at one time that it was a question of life or death for the industry. However, the spinning mills have now smoothly switched over to the new system and have successfully surmounted the difficulties and obstacles that confronted them.



Head Office of Toyo Cotton Spinning Company

It was so early as in 1887 that the abolition of the midnight operation was contemplated in Japan. The draft plan of the Factory Operatives Regulations drawn up in June of that year provided that factories must not permit male workers of 14 years of age or under and female operatives of any age to work throughout the night. Although this plan which was composed of four chapters and 46 articles, was not published in those days, it serves to show what was in the mind of legislators in those days.

Several years later, it was advocated that various investigations should be conducted in preparation for enactment of the Factory Law, and as the result, the Factory Investigation Section was created in the Commerce and Industry Bureau of the Department of Agriculture and Commerce in 1902 to carry on the work. In November, 1902, what they called the Summary of the Factory Law Bill was drawn up, and it was distributed among all the Government Departments, prefectural Governors, and Chambers of Commerce with the object of sounding their opinion on this bill. It was after the issuance of this bill that the proposal to abrogate midnight operation attracted much attention of the public in Japan. This draft plan provided that factories must not permit male and female operatives under the age of 16 to work between 10 p.m. and 4 a.m.

This Factory Law bill was introduced in the 26th session of the Imperial Diet in 1909 after it was considerably improved in accordance with various suggestions. Concerning the proposed abrogation of the midnight operation, the bill contained a clause that it should take effect 10 years after the law was promulgated. And yet, the bill was severely criticized in the Diet on the ground that it was still too early for Japan to consider such a reform. The cotton spinning people, among others, raised a vigorous opposition. The Japan Cotton Spinners' Association filed a petition with the Government stating that if female operatives were prevented from working at night, it would result in an enormous shortage of the cotton yarn supply, and that the spinning mills could not increase the number of spindles to make up the decline of production within 10 years. The Government withdrew the bill in February, 1910.

In the next session of the Imperial Diet in 1911, however, the Factory Law was again introduced after drastic changes were effected. The House of Representatives passed it after some amendments were made, and the House of Peers also passed it.

After nearly 30 years of hard work on the part of the Government authorities in charge, the Factory Law was thus promulgated on March 28, 1911. It is noteworthy, however, that the law thus enacted provided that the abolition of the midnight operation be effected 15 years after the passage of the law. And, the law did not take effect until September 1, 1926, it having been impeded by various complicated circumstances.

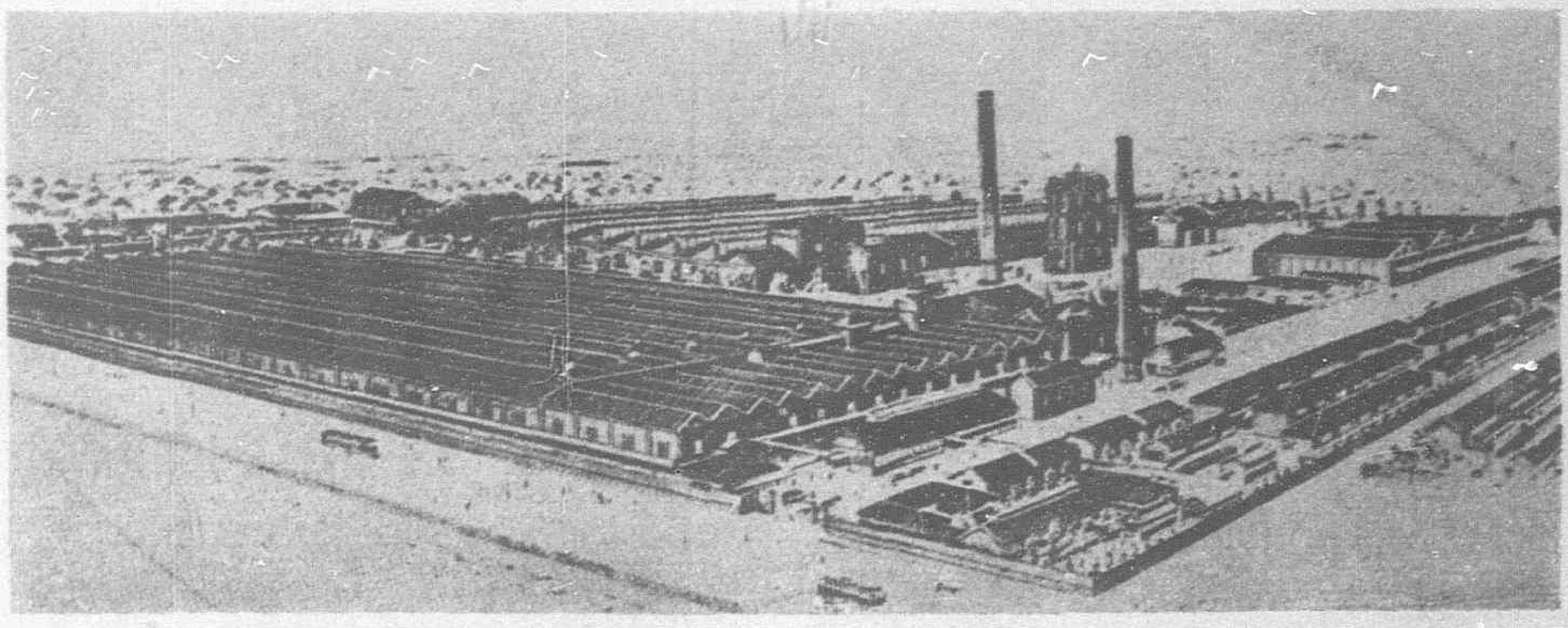
The convocation of the first International Labor Conference in Washington in October, 1919, and its agenda concerning the abolition of the midnight operation attracted much attention of Japan's industrial circles, especially among the cotton spinning companies. The Japan Cotton Spinners' Association held its committee meetings frequently to exchange views as to how best to cope with the situation. As China and Japan were only two countries where the midnight operations were in practice in spinning mills, the abolition of the system was a question of time.

Mr. Sanji Muto, at one of the foregoing committee meetings held in August, 1919, stated: "If the eight hour day system be adopted and the midnight operation be given up, it would signify the curtailment of production by about one-third of Japan's entire manufacturing capacity. In order to make up the cut in the output, about Y.150,000,000 of new investments is required to install more spindles. Furthermore, the curtailment of operation may result in the decrease of operatives' income and also in the rise of market prices. Neverthless, it goes without saying that midnight operation is harmful to the operatives' health, and that it has to be abolished sooner or later. Only, Japan could not do it immediately. Consequently, all we can do is to ask the understanding of foreign delegations at the Conference as to Japan's peculiar situation, and meantime, we must improve the situation gradually."

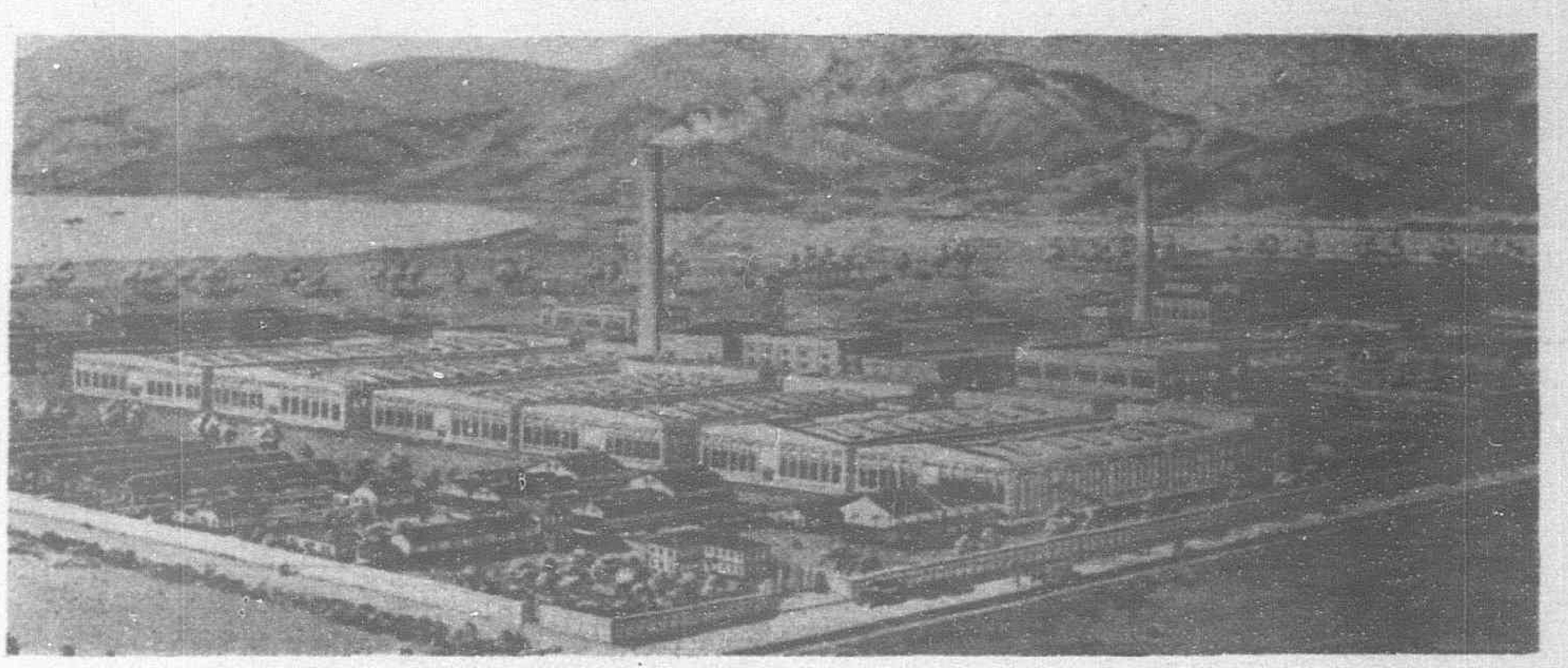
In this statement of Mr. Muto, the situation in Japan in those days is very well explained. The first International Labor Conference, however, gave such a strong stimulation to the Japanese Government that it soon found that the Factory Law had to be further improved. Subsequently, in the 46th session of the Imperial Diet in 1923, the bill proposing the revision of the Factory Law was introduced, and it was passed in its original form. The revised Factory Law was promulgated on March 29, 1923.

It is provided in Article 4 of the revised Factory Law that factory owners could not employ male operatives of under 16 years of age and female operatives work between 10 p.m. and 5 a.m., but that with the approval of the local administrative authorities in charge, they could make these operatives work until 11 p.m., instead of 10 p.m. The additional clause to this article provided, among other things, that at factories where they had two shifts of operatives, this regulation need not be applied for three years after the revised Law took effect, and that during this grace of three years, the age limit of 16 years be reduced to 15 years.

It was thus decided that the much-talked about abolition of the midnight operation be prohibited in the course of three years after the revised factory Law took effect. But, after the great earthquake of September, 1923, there was no knowing when the revised Factory Law might take effect as Japan's industry was so severely affected by the vast devastation.



Aichi Mills, Where "The Abolition of Night Work" was First Introduced



Katata Mills, the Principal Mills of the Toyo Cotton Spinning Company

Meanwhile, Japan's all-night work was so vigorously attacked by the British and Indian delegates at the 7th and 8th International Labor Conference that the Japanese Government could not delay the enforcement of the revised Factory Law. It was at last promulgated on June 5, 1926, that the revised Factory Law takes effect on July 1, 1926. Hence the abolition of the midnight operation on July 1, 1929, when the three years' grace provided in the additional clause of Article 4 expired.

Many influential cotton spinning companies carried out the abolition of the midnight operation at their mills without waiting for the expiration of the three years' grace. They did their utmost to prepare for the new system, conducting various experiments, as the new system was to affect them most.

On October 1, 1926, there were 196,187 male and female factory operatives who were engaged in all-night work. (It is to be remembered that the additional clause of Article 4 of the revised Factory Law provided that factories may employ juvenile workers under 15 years of age and female operatives for three years after the Law took effect provided that they were engaged in the work in turn by shifts). It is estimated, therefore that about one half of the foregoing total was always on night work. Of the foregoing total of 196,187, up to about 99 per cent. or 195,256 of them were women and the remainder of 931 were male operatives under 15 years of age. (The revised Factory Law might just as well be called that of setting female operatives free from their all night work !)

Further classification of these protected operatives showed that 192,746 women and 828 boys under 15 years of age out of the foregoing total were engaged in the spinning, weaving and dyeing enterprises, and that 145,884 women and 568 boys were in the employ of cotton spinning companies. Consequently, it was found that the total number of these protected operatives in the employ of the cotton spinning companies corresponded to 74 per cent. of the aggregate total number of the protected operatives and that it is the spinning industry which would be chiefly affected by the abolition of the midnight work of the protected operatives. It is on account of this fact that the spinning companies studied the effect of the new measure most earnestly, and prepared themselves for the new system with unusual eagerness.

There were seven companies which abolished midnight operation before March 1, 1929, according to the Japan Cotton Spinners' Association. These companies owned 38 mills where 1,949,304 spindles were operated. By April 1, 1929, 14 companies owning 79 mills and 3,504,240 spindles gave up the all-night work. One month later, 17 companies with their 88 mills and 3,990,748 spindles had adopted the new system.

As the aggregate total number of spindles installed in the Japanese cotton spinning mills all over the country stood at 6,358,042 spindles on May 1, 1929, the mills operating a little more than 60 per cent. of the entire number of these spindles gave up midnight operation two months before the expiration of the three years' grace. If the number of operatives in the employ of spinning mills were in proportion to that of spindles, about 60 per cent. of the entire number of the operatives shared the benefit of the new system before May 1, 1929.

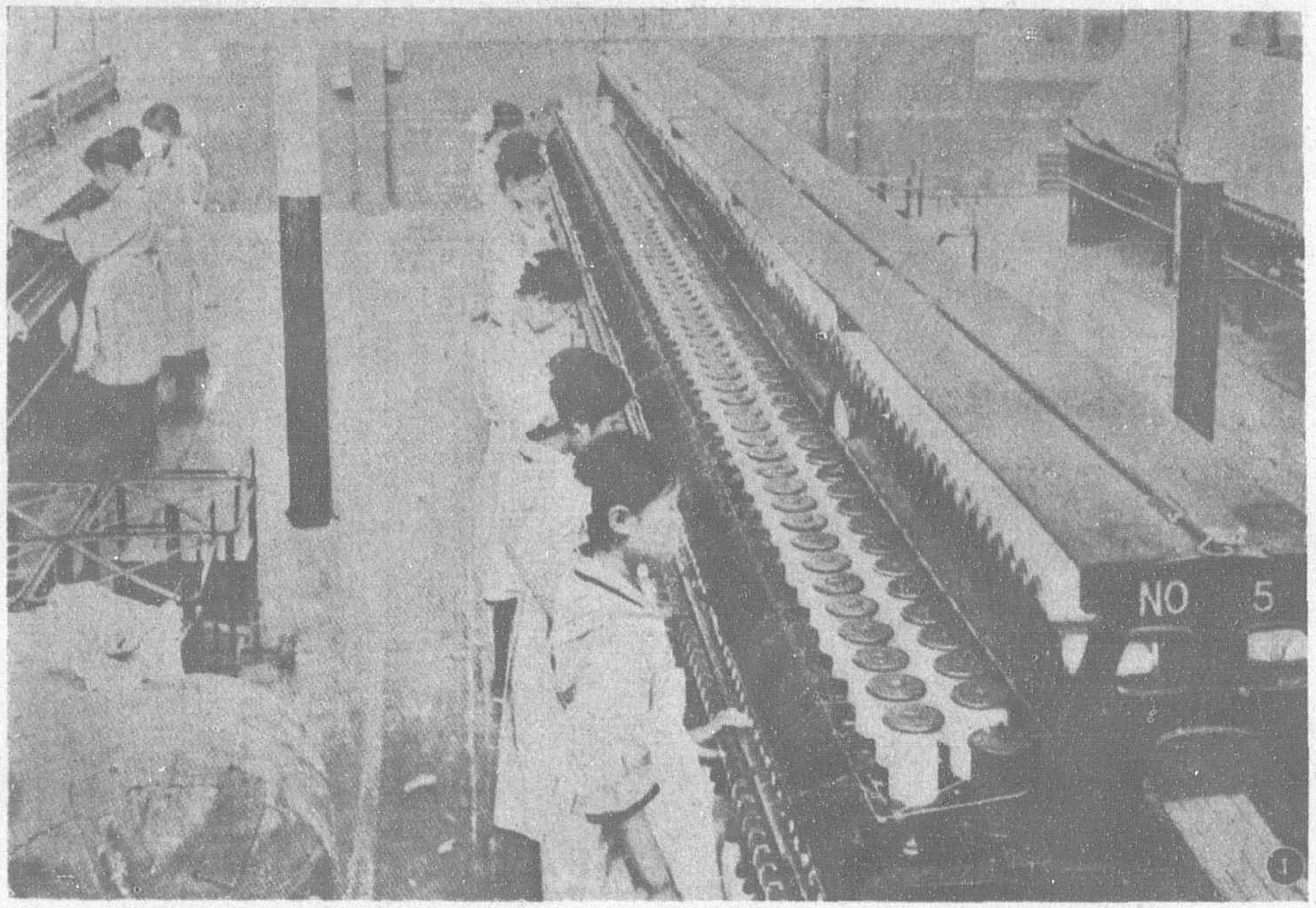
The Nisshin Cotton Spinning Company was the first to carry out the change, it having given up midnight operation on January 23, 1923. Next came the Toyo Cotton Spinning Company and the Dai Nihon Cotton Spinning Company which gave up midnight operation on February 1, 1929.

The Toyo Cotton Spinning Company issued a statement just before it switched over to the new system, and this statement serves well the purpose of illustrating what preparations were made, and how the spinning companies faced the music. In substance, the statement read :

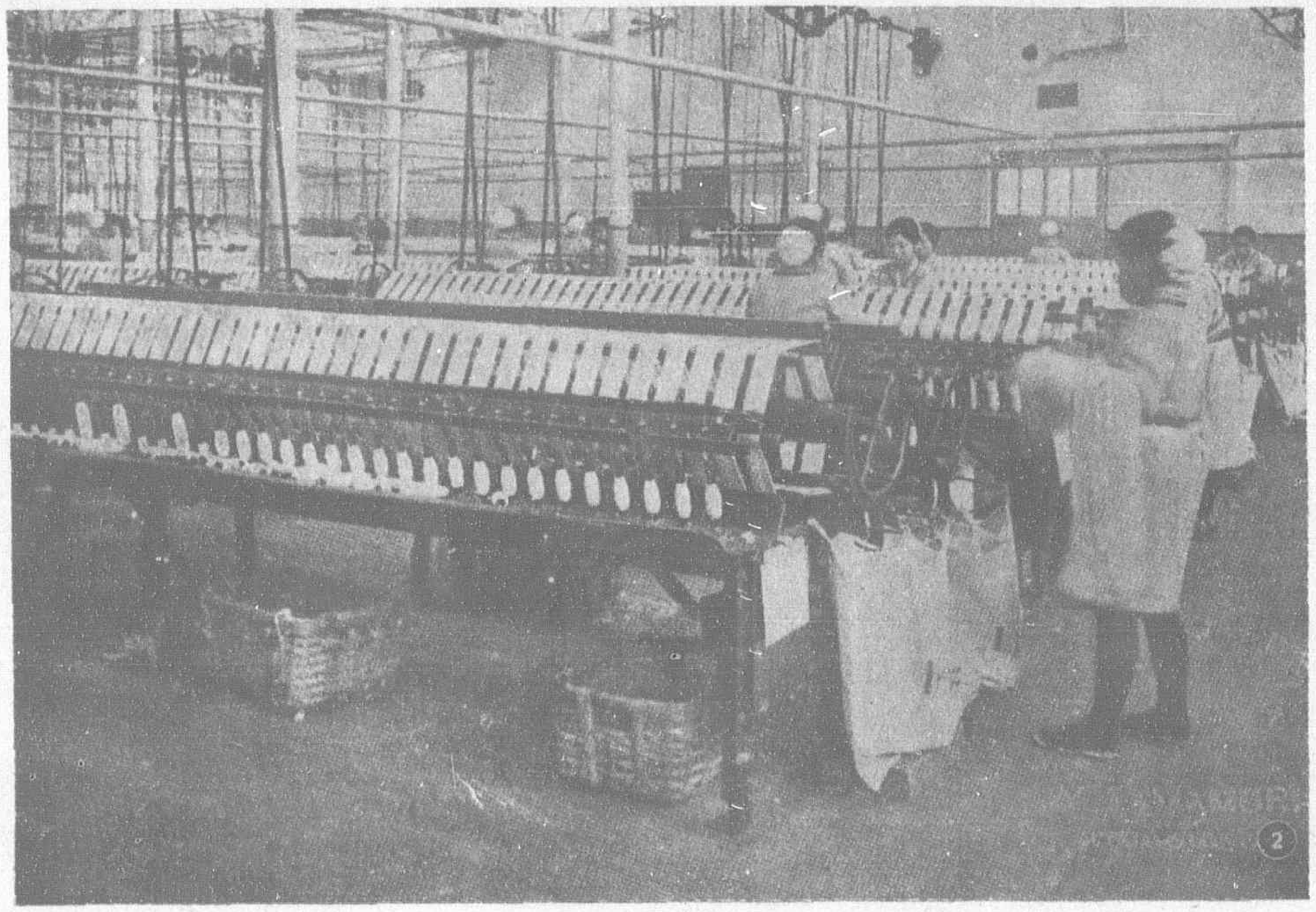
> "This company has hitherto carefully contemplated the proposed abolition of the midnight operation, and has conducted experiments at our Oji mill since August, 1925. Based on what we have learned as the result of this experiment, we have decided that the new measures be applied at our mills in Aichi and Mie Prefectures (where there are 12 of them—*Ed.*) and some of the other mills on and after February 1, 1929.
>
> "The spinning and weaving departments of our mills will be run on the basis of three shifts of operatives, and these shifts of operatives will be interchanged four times a month. At each of these changes, they will have 24 hours continuous rest. Each shift works nine hours, including half an hour for rest and food ; therefore, the net working hours are eight hours and a half.
>
> "Compared with our previous standard of working hours, which was 10 hours a day and 26 days a month, the net working hours of each individual operative in the new system decreases. Neverthless, the wages paid in accordance with the amount of work done will be increased in the unit price in such a manner that the monthly income of the operatives will be maintained the same as before ; moreover, they will be able to increase it by means of improvement of their efficiency. The wages paid by day will also be increased to some extent. The number of operatives will not be decreased as the result of the application of the new system."

The statement adds that the foregoing was the basic principles, and partial changes will be inevitable in accordance with the peculiar situation of each mill.

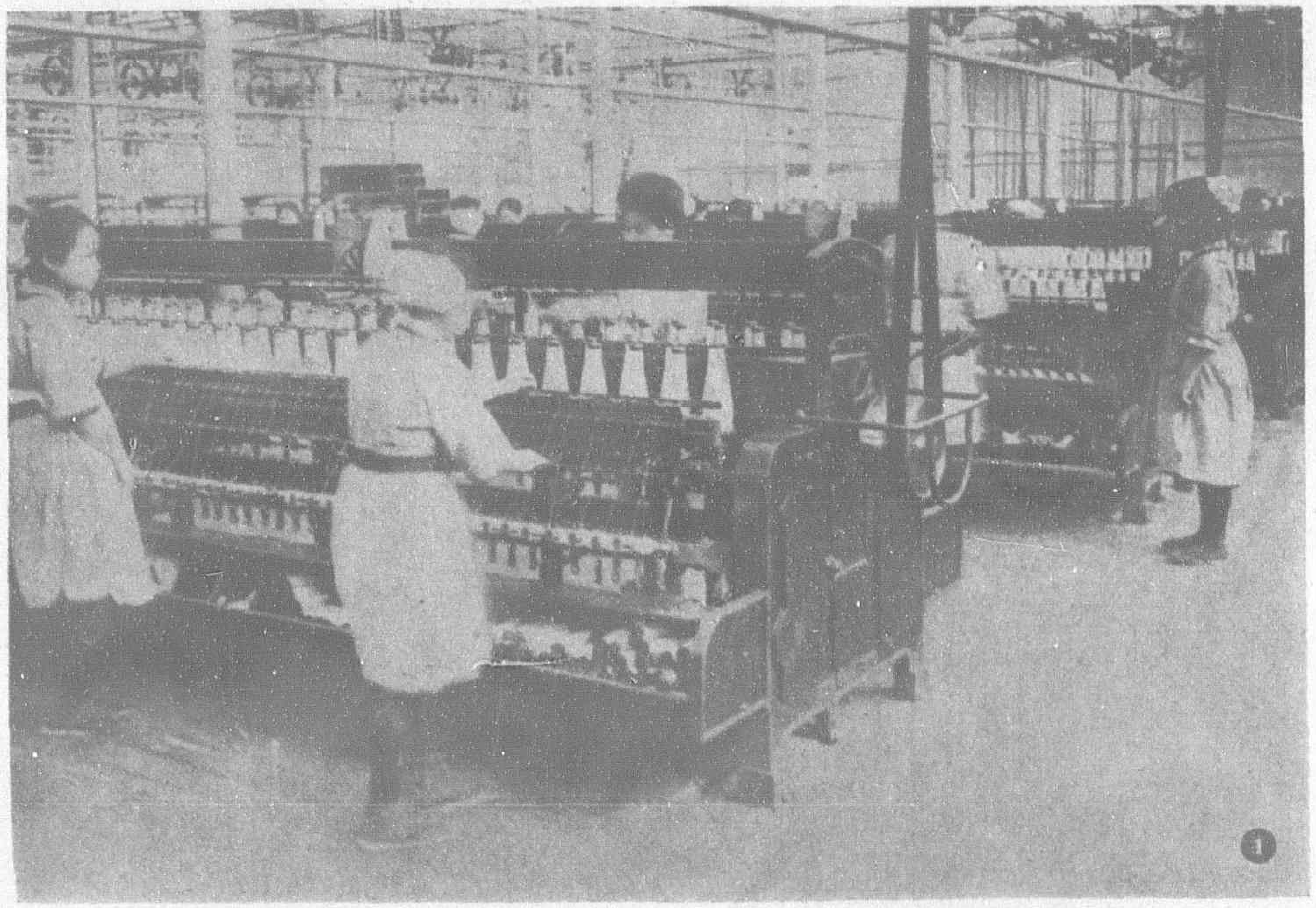
Some Stages in the Manufacturing Processes of Toyo Owned Mills



Spindle Winders

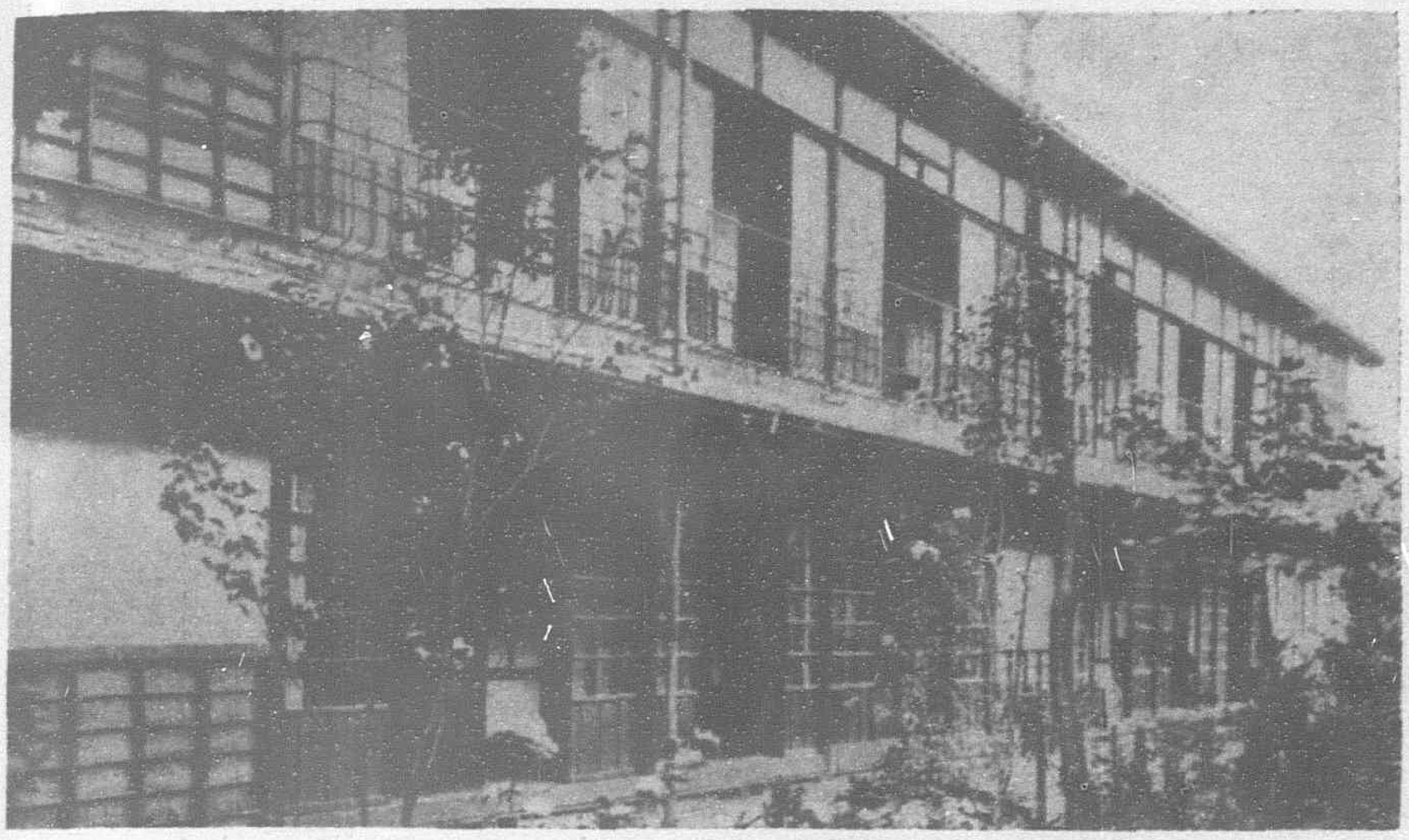


Single Reels



Clearer Winders

Bundling Press



Exterior View of Female Dormitory of Toyo Owned Mills

Arrangement of Working Hours

Most of the spinning mills in Japan had hitherto adopted the two shifts system, each shift of operatives working for 11 hours day; the first shift of them would work from 6 a.m. to 5 p.m., and the second shift, from 6 p.m. to 5 a.m. Of the foregoing working hours, they were given one hour for rest and meal, and therefore, under this system, they worked for 10 hours net. (At some mills, each shift of operatives worked for 12 hours, or 11 hours net, as they were also given one hour for meal and rest).

The Creche

Under the new system, the mills have to suspend their operation for seven hours between 10 p.m. and 5 a.m., and that leaves 17 hours for working hours a day. If two shifts of operatives were to work during the 17 hours, each shift of them are to work for 8½ hours, and as there is to be given a 30 minutes for food and rest during working hours. This, in effect, establishes an eight hour day net. This means the decrease of working hours by two hours compared with the old system when they had to work 10 hours net a day.

If the operatives were to work until 11 p.m. instead of 10 p.m., one shift of operatives work for nine hours a day, or eight hours and a half net, excluding 30 minutes for food and rest. Compared with the old system, this signifies a decrease of working hours by 1½ hours. And, as most of the spinning companies adopt this system, the decrease of their working hours a day total three hours net on the average.

Under the new system, furthermore, holidays can be decreased from four days to two. Calculating on the basis of 30 days a month, the aggregate total working hours per month at spinning mills under the old system amounted to 520 hours (20 hours a day, 26 days a month), but in the new system, the aggregate total working hours is decreased by 44 hours to 476 hours (17 hours day, 28 days a month) on the average.

The decrease in the working hours and increase in the leisure necessarily give rise to important problem of how to arrange the working hours and how best take advantage of the leisure.

Primarily, the ideal working conditions are that of the one shift system, operating during the day time only. In the present situation of Japan's industry, however, this cannot be done. The spinning mills, therefore, must carry on work under the two shift system.

At most of the spinning mills where the abolition of midnight operation has been accomplished the operatives work until 11 p.m. The Dai Nihon Cotton Spinning Company's mills alone, however, divide the working hours as follows:

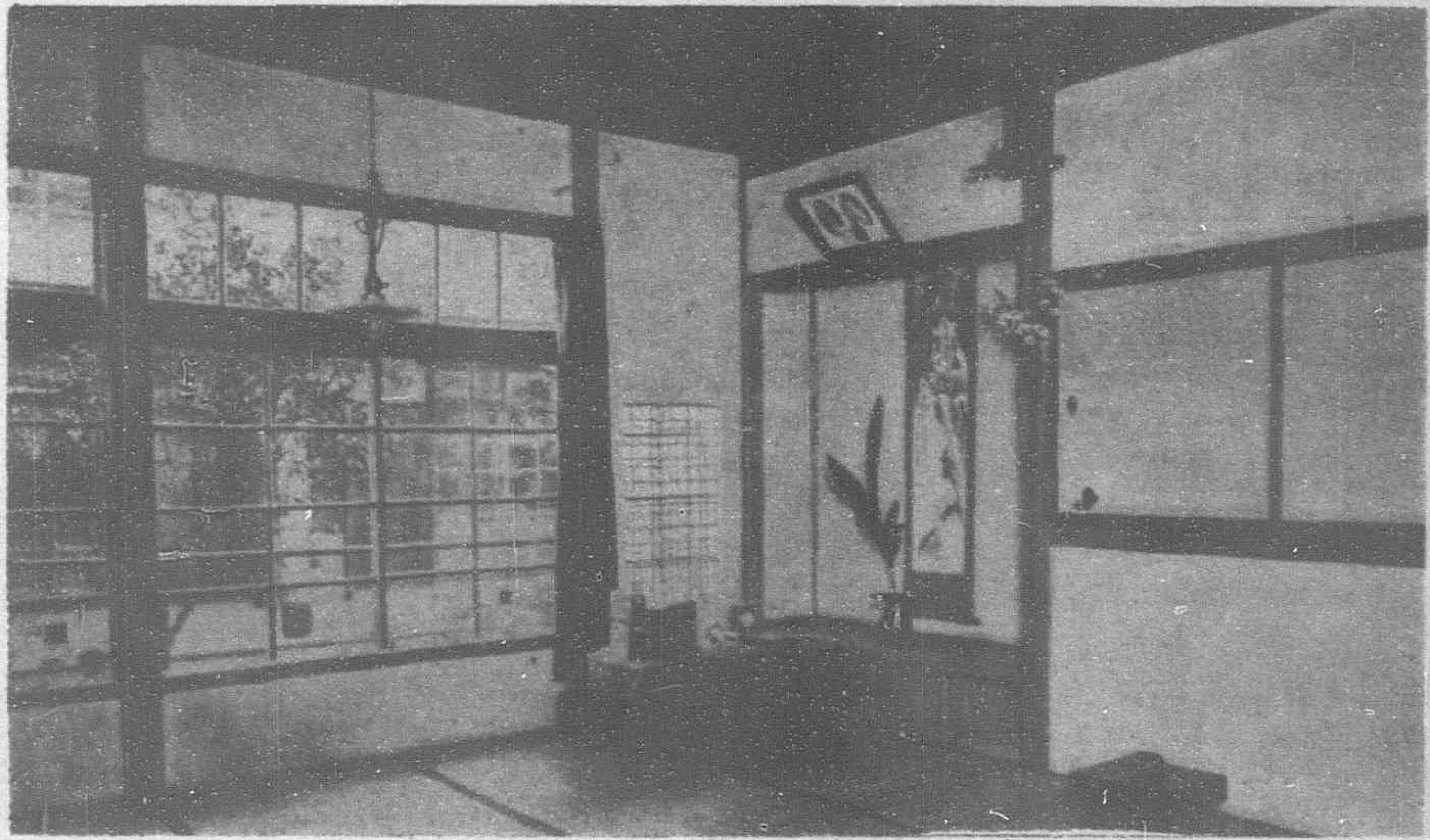
First shift—from 5 a.m. to 3 p.m.
Second shift—from 3 p.m. to 11 p.m.

According to the foregoing system, the first shift of operatives work for nine hours and a half, excluding 30 minutes' time of their own, while the second shift works for seven hours and a half, excluding half an hour's time of their own. This system was adopted in consideration of the fact that those who work at night might be more fatigued than those working during the day.

In addition to the foregoing two shifts, there is another shift of operatives who work exclusively during the day. But, the time arrangement for this shift differs almost one mill to another.

As shown in the foregoing schedule of working hours, only half an hour's time is given to operatives to rest during the work hours, in accordance with article 7 of the Factory Law which provides that when the work hours are longer than six hours, at least 30 minutes of rest shall be given to the operatives. It is noteworthy, in this connection, that the foregoing 30 minutes' rest hour is also allotted to the meal hour, which may not have been the original intention.

The schedule arranged for meals under this new system has not yet met the problem of dividing the working hours in such a manner that the intervals between meals

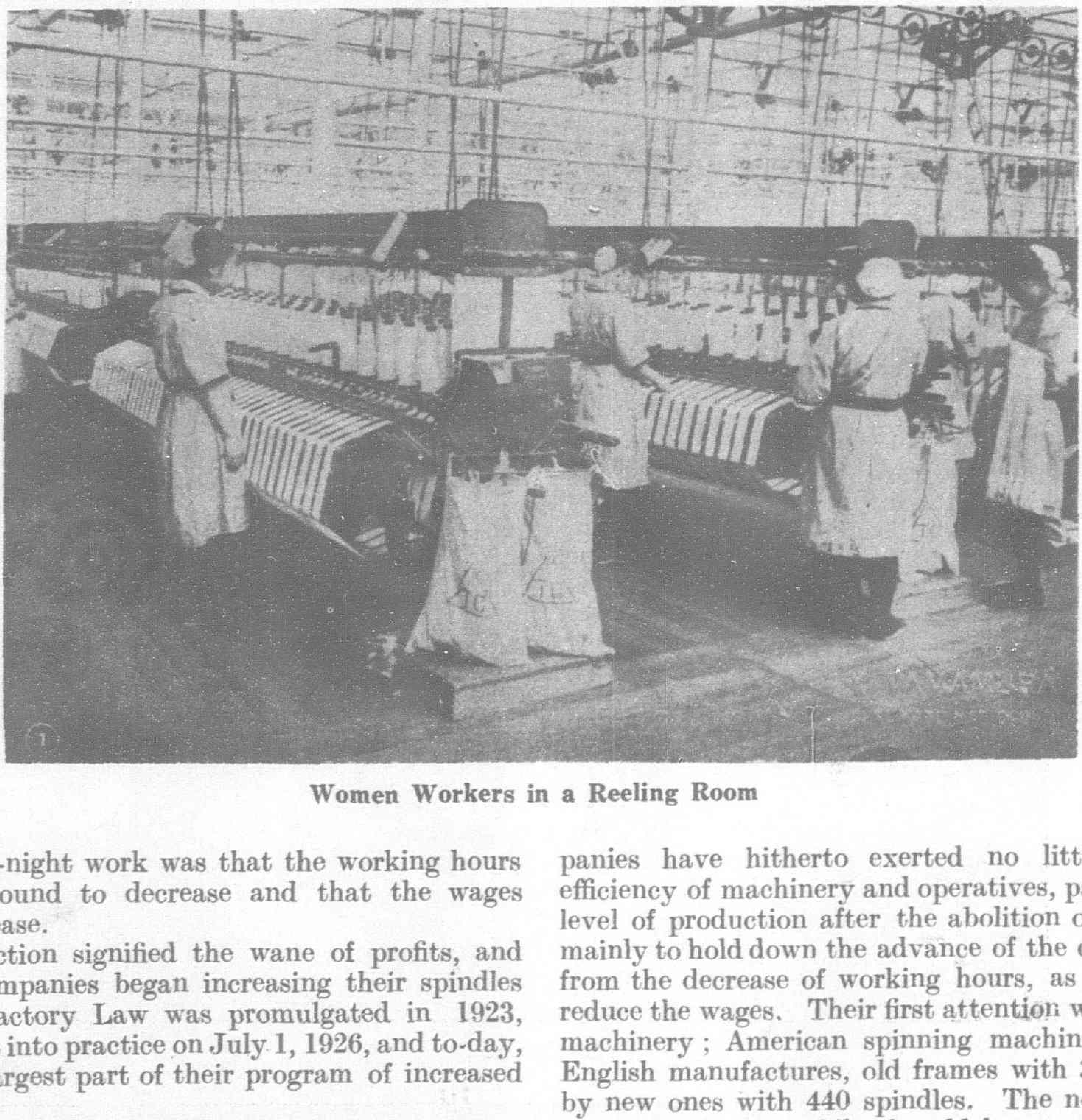


Living Room of Male Dormitory of Toyo Owned Mills will not be so long as to impair the efficiency of the workers. The utility of free hours which has been increased in the new system also requires careful consideration as it has direct bearing upon the operatives' efficiency of the following day's work, as well as the personal conduct of the operatives. Under the foregoing arrangement of the working hours, the first shift of operatives are free after 2 p.m., while the second shift of them are free before noon until the work starts at 2 p.m., both of them having about seven hours free. Estimating that they spend two hours for eating and bathing, they still have five hours of leisure.

The spinning mill management encourages the operatives to spend some of these free hours in sports or collective games in order to improve their health, and also, encourages them to study at special classes opened within the mills. Some of the main items in which the male and female operatives are expected to spend their free hours are as follows:

Male operatives: sports (tennis, base ball), games ("go" and "shogi"), cultivation of good taste, farming (a certain lot of land is offered at disposal of operatives to be cultivated), meetings for writing poetry, wood carving, reading, lectures on mental culture, army drill, etc.

Female operatives: special classes (some mills have newly opened them), flower and tea ceremonies, sewing, cooking, reading, penmanship practice, music, laundry work, lectures on mental culture, mass games and drills, encouragement of side-jobs among the employes who live at their own homes (such as chicken raising), cultivation of flowers, etc.



Women Workers in a Reeling Room

What the spinning mill owners were concerned about most in the face of the inevitable abrogation of the all-night work was that the working hours of the operatives were bound to decrease and that the wages subsequently were to increase.

The decline of production signified the wane of profits, and therefore, the spinning companies began increasing their spindles as soon as the revised Factory Law was promulgated in 1923, particularly after it was put into practice on July 1, 1926, and to-day, they have completed the largest part of their program of increased spindleage.

According to statistics compiled by the Japan Cotton Spinners' Association, the spinning companies increased the number of their spindles by about 13 per cent. during the three years' grace, from July, 1926, until March 1, 1929. The number of looms, too, was increased by about 8 per cent., from July, 1926, until the end of 1928, as shown in the accompanying table:

Date	*No. of Spindles*	*No. of Looms*
June, 1926	5,586,027	74,193
December, 1926	5,679,852	77,043
June, 1927	5,929,614	76,163
December, 1927	6,116,266	78,352
June, 1928	6,272,186	79,777
December, 1928	6,474,174	81,209
March 1, 1929	6,344,082	—

It is noteworthy, however, that the spinning companies effected the curtailment of their operation in May, 1927, that they had maintained it until the end of June, 1929, and that this fact has a significant bearing upon the manufacturing capacity after the abolition of the midnight operation. The members of the Japan Cotton Spinners' Association, in May, 1927, agreed to suspend the operation of 15 per cent. of the total number of their spindles to cope with the adverse market situation in those days. The market, however, developed hardly any substantial improvement, and the curtailment of operation was further increased to 23 per cent. on November 15, 1928. With the object in view of encouraging the early realization of the abolition of the midnight operation, however, it was agreed that when the second curtailment was effected that the mills giving up the all-night operation before March 1, 1929, may convert their holidays and the decrease of the working hours in the new system into terms of the number of spindles and release the curtailment proportionately, and that the mills giving up all-night work after April 1, 1929, may release the curtailment almost entirely.

Although the official percentage of curtailment was 23 per cent., the actual limitation came down to about 14.6 per cent., when exceptions provided in the agreement, are taken into consideration. Consequently, when the curtailment is entirely given up, the increase of production amounts to about 14.6 per cent.

And now about the decrease of working hours in the new system: compared with the old system, it decreases on the average from 20 hours to 17 hours a day. Theoretically, therefore, the production in the new system is to decrease by 15 per cent. a day. But, if only two days' holidays be given to operatives instead of four days of the old system, the actual decrease of working hours comes to about 8.4 per cent. a month. Consequently, so far as the lifting of the curtailment and the decrease of working hours in the new system are concerned, the production is to increase by about 6.2 per cent.

The spinning companies have hitherto exerted no little effort to increase the efficiency of machinery and operatives, partly to maintain the same level of production after the abolition of the midnight work, but mainly to hold down the advance of the cost of production resulting from the decrease of working hours, as they could not very well reduce the wages. Their first attention was directed to the spinning machinery; American spinning machinery were replaced by the English manufactures, old frames with 384 spindles were replaced by new ones with 440 spindles. The new weaving mills installed automatic looms, while the old looms were gradually replaced by automatic or semi-automatic looms. In order to save man power within the mills, new conveyers were installed, while the long belt which connected the ceiling and floor was replaced by individual motors connected with the spinning and weaving machinery. Moreover, better raw cotton came to be used as high speed of operation required stronger thread.

The daily output of cotton yarn and textiles per spindle and per loom as the result of the foregoing improvements showed a material improvement as shown in the accompanying table:

Date	*Ring (Momme)*	*Mule (Momme)*	*Loom (Yard)*
1st half of 1926	86.3	119.6	60.73
2nd half of 1926	81.2	108.0	61.55
1st half of 1927	84.7	140.8	62.66
2nd half of 1927	83.5	184.6	59.56
1st half of 1928	86.0	193.4	64.73
2nd half of 1928	88.1	196.6	64.34
January, 1929	90.2	174.9	65.81
February, 1929	91.2	179.8	66.11

As shown in the foregoing table, the daily output of cotton yarn per spindle during the second half of 1928 registered an increase of about 2 per cent. in the ring, and about 64 per cent. in the mules ; the latter figures are remarkable. The daily output of cotton textiles per loom, too, registered an increase of about 8.8 per cent.

In addition to enforcing punctuality and demanding a full working day, the spinning companies resorted to a more effective measure, of increasing efficiency and that is the reduction in the number of operatives. To cut down the number of operatives without reducing the aggregate total amount of work comes to mean a considerable increase of the volume of work done by each individual operative. During the three years ending December, 1928, the spinning companies have reduced the number of male operatives by about 8 per cent., and that of female operatives by about 16 per cent. The number of operatives engaged in the weaving mills also registered similar decreases. This fact, together with the report that the daily output per spindle and per loom materially increased during the past three years, show that the efficiency of each individual operative had been greatly promoted. The following table, which gives a daily average of the number of spindles operated and the number of operatives at work, further illustrates how the spinning and weaving mills endeavored to promote the efficiency of operatives :

SPINNING MILLS.

Period	*Daily average of No. of operatives*	*Daily average of No. of spindles operated*
1st half of 1926	182,956	4,949,680
2nd half of 1926	182,086	5,056,184
1st half of 1927	177,246	5,000,290
2nd half of 1927	163,048	4,662,569
1st half of 1928	153,545	4,704,094
2nd half of 1928	154,561	4,983,089
January, 1929	152,612	5,154,455

WEAVING MILLS

Period	*Daily average of No. of operatives*	*Daily average of No. of looms operated*
1st half of 1926	58,209	64,905
2nd half of 1926	56,577	66,492
1st half of 1927	53,707	67,808
2nd half of 1927	47,347	65,658
1st half of 1928	34,505	68,601
2nd half of 1928	43,907	72,611
January, 1929	43,988	74,069

Note :—The number of operatives given here is the total of three shifts of operatives working day and night, and therefore, the actual number of spindles and looms handled by each individual operative cannot be obtained out of these statistics, but it shows a general tendency that the number of both spindles and looms handled by each operative increased. Although this saving of man power is partly due to the fact that automatic looms were installed, it may be inferred, in view of the increase of output per unit, that the spinning mills endeavored to promote the efficiency of operatives by means of increasing the number of spindles and looms left in charge of individual operatives.

Another effort shown on the part of the management to rationalize the operation is that they have succeeded in saving the consumption of coal. On the average, the amount of coal consumed per bale of cotton yarn durung 1928 showed a decrease of 26 per cent. as compared with that of 1926.

With all the foregoing efforts made by the spinning company to improve the efficiency of machinery and operatives in order to cover what it loses as the result of the decrease in the working hours, it still remains to be seen as to how far the management will succeed in doing so. It is generally believed, however, that the withdrawal of the curtailment of operation and the increase of the number of spindles and looms, plus betterment of efficiency of machinery and operatives may result in an increase of production by about 10 per cent. In view of the fact that the annual production of cotton yarn during 1928 amounted to 2,451,862 bales, the annual production after the abolition of the midnight operation may roughly amount to 2,700,000 bales, provided that the manufacturing capacity was actually increased by 10 per cent.

A Statistical Survey of Japan's Cotton Industry

By EISABURO KUSANO

The Japan Cotton Spinners' Association has just issued its semi-annual statistical report of the industry for the first half of 1929, showing that the capital investments and reserves as well as the manufacturing capacity and production had registered an all round increase during the six months ending June, 1929.

At the end of June, 1929, there were 72 cotton spinning and weaving companies in Japan, including 13 companies that are not members of the Association. The aggregate total of the authorized capital of these 72 companies stood at Y.558,696,250, the paid up capital and the reserves amounting to Y.428,098,852 and Y.257,406,526, respectively. Included in these foregoing totals are the combined authorized capital of the 13 non-members of the Association, amounting to Y.51,350,000, and the paid up capital and reserves of Y.40,775,000 and Y.877,365.

These companies operated 259 factories where 6,487,720 ring and 41,674 mule spindles, 807,100 doubling spindles and 78,870 looms were installed. Of these totals, 14 mills, 177,408 ring and 4,680 mule spindles, 13,764 doubling spindles and 4,482 looms belonged to non-members of the Association.

In the accompanying table, the foregoing statistical survey of the present state of affairs of the cotton spinning and weaving industry are compared with the past five years. (Note :—The following totals include the reports of 13 non-members of the Association.)

Years	*No. of Companies*	*Authorized Capital*	*Paid up Capital*	*Reserves*
June 30, 1929	72	558,696,250	428,098,852	257,406,526
December 31, 1928	72	552,196,250	419,792,127	249,678,831
December 31, 1927	64	535,077,500	391,550,767	238,367,331
December 31, 1926	64	539,237,500	391,305,247	231,149,181
December 31, 1925	64	551,362,500	382,714,817	223,531,448
December 31, 1924	69	575,302,500	398,163,443	219,043,315

Years	*No. of Mills*	*No of Spindles Ring*	*Mule*	*Doubling Spindles*	*Looms*
June 30,1929	259	6,487,720	41,674	807,100	78,870
December 31, 1928	259	6,425,500	41,674	809,452	81,209
December 31, 1927	257	6,079,272	36,994	787,490	78,352
December 31, 1926	247	5,644,772	35,080	789,688	77,043
December 31, 1925	243	5,413,094	34,090	759,632	73,381
December 31, 1924	247	5,100,056	25,150	685,995	68,579

An analysis of reports made by 57 members of the Association shows that on the average they operated 5,418,774 spindles, including 5,393,992 ring and 24,782 mule spindles, a day during the first half of 1929. The output of cotton yarn by operation of ring spindles during the period under review totaled 65,633,293 kamme (one kamme corresponds 8.32 lbs.) and that of mule spindles, 331,439 kamme, making a total of 65,964,732 kamme. On the average, the output per spindle per day was 88.8 momme for ring and 161.8 momme for mule spindles. (120.9 momme corresponds one lb.) The amount of raw cotton consumed by these companies reached 75,931,399 kamme, and the cotton fly and waste yarn produced were 8,742,078 kamme and 406,568 kamme, respectively. They consumed 321,923,837 lbs. of coal, the average price per 10,000 lbs. being Y.56.56. The actual power used was 27,784 h.p. of fire, 171,039 h.p. of hydro-electric and gas power. The consumption of coal per h.p. per hour was 3,002 lb. The number of operatives who were engaged in the work averaged 35,309 male and 121,323 female operatives per day.

Reports sent to the Japan Cotton Spinners' Association by its 59 members show that they consumed a considerably larger quantity of raw cotton during the first half of 1929 as compared with the preceding half year, for it totaled 75,931,399 kamme for the first half of 1929 against 71,242,017 kamme for the second half of 1928. Included in the foregoing total for the first six months under review are 36,041,526 kamme of Indian cotton, 34,345,669 kamme of American cotton, 1,770,611 kamme of Chinese cotton, 1,815,626 kamme of Egyptian cotton, 470,311 kamme of African cotton, 40,466 kamme of Annamese and Saigonese cotton, 1,044.128 kamme of Chosenese cotton, and 403,062 kamme of other cotton. It is noteworthy that Japan imported the African cotton during the first half of 1924, and that the import has been steadily kept up to this day.

In the following table, a semi-annual report of raw cotton consumption by members of the Japan Cotton Spinners' Association will be given in accordance with the principal items. (Note : One kamme corresponds 8.32 lbs.)

CONSUMPTION OF COTTON

Periods		*Indian Cotton*	*American Cotton*	*Chinese Cotton*	*Total*
1st half, 1929	...	36,041,526	34,345,669	1,770,611	75,931,399
2nd half, 1928	...	34,665,827	31.514,537	1,719,226	71,242,017
1st half, 1928	...	27,128,222	30,379,012	5,650,574	66,672,014
2nd half, 1927	...	31,807,021	32,056,664	1,389,046	68,617,708
1st half, 1927	...	34,381,532	35,394,340	511,941	74,076,738
2nd half, 1926	...	38,747,870	29,577,237	1,367,543	73,811,267
1st half, 1926	...	41,010,816	28,798,485	1,027,228	74,619,325
2nd half, 1925	...	42,275,728	22,982,984	1,213,286	70,011,071
1st half, 1925	...	34,561,554	22,622,597	4,455,440	66,054,376
2nd half, 1924	...	34,373,196	16,953,227	3,722,927	59,057,328
1st half, 1924	...	33,303,112	16,910,416	3,343,687	57,224,316

NOTE :—The foregoing totals includes, in addition to the Indian, American, and Chinese cotton, the Egyptian, African, Annamese and Saigonese, Chosenese, and other cotton, consumed by members of the Japan Cotton Spinners' Association.

Yarn Production Increases

As it was predicted by experts that the cotton yarn production will increase after the all-night work by juvenile and female operatives is abolished, so the production showed increases in and after April, 1929, when many companies gave up the midnight operation though the official date for the measure was July 1, 1929, as compared with the corresponding months of the preceding months, as shown in the following table which compares the monthly production in 1929 with that of 1928 and 1927. (Unit : Bales.)

Months				*1929*	*1928*	*1927*
January	...	...	...	219,399.0	194,377.5	215,371.0
February	...	...	...	216,552.0	198,098.5	220,727.5
March	...	...	...	218,635.0	194,015.0	224,450.5
April	...	...	...	229,601.0	200,579.0	234,889.0
May	...	...	...	231,949.0	200,955,0	208,978.0
June	...	...	...	231,623.0	199,058.5	209,414.0
July	...	...	...	224,707.0	201,131.0	196,880.15
August	...	...	...	223,239.0	204,445.0	197,104.0
September	...	....	...	238,378.0	203,152.5	202,753.0
October	...	...	...	—	211,045.0	206,741.5
November	...	...	...	—	217,105.0	208,599.5
December	...	...	...	—	227,896.0	204,784.0

For the past 10 years, the cotton yarn production in April, 1927, was the record for the heaviest monthly output with its 234,889 bales, but the output of September, 1929, was still heavier than that as it totaled 378,238 bales.

Keeping pace with the foregoing heavy increase of production, the export of cotton yarn as well as what is inferred to be the domestic consumption has also registered heavy increases. During the first six months, of 1929 the cotton yarn production totaled 1,347,759 bales, including 399,105 bales of left 20s and 4,177.5 bales of right 16s. The import of foreign cotton yarn into Japan during the period under review amounted to 1,692 bales, making the total supply in Japan sum up to 1,349,451 bales. Of this total, 33,775 bales were exported, leaving a balance of 1,315,676 bales which might be inferred as the domestic consumption. The following table gives the semi-annual returns of the output, import, total supply in Japan, export, and the domestic consumption for the past five years : (Unit : bales.)

Periods			*Output*	*Import*	*Export*	*Domestic Consumption*
1st half, 1929	...	...	1,347,759.0	1,692	33,775	1,315,676.0
2nd half, 1928	...	...	1,264,778.5	1,502	31,822	1,234,458.5
1st half, 1928	...	...	1,187,083.5	2,161	39,833	1,149,411.5
2nd half, 1927	...	...	1,216,862.5	2,337	45,541	1,173,658.5
1st half, 1927	...	...	1,313.830.0	484	72,113	1,242,201.0
2nd half, 1926	...	...	1,292,231.0	2,487	79,788	1,214,930.0
1st half, 1926	...	...	1,315,515.5	450	125,762	1,190,203.5
2nd half, 1925	...	...	1,244,312.0	280	150,428	1,094,264.0
1st half, 1925	...	...	1,192,471.5	3,261	160,373	1,035,359.5
2nd half, 1924	...	...	1,049,167.5	1,067	121,932	928,302.0
1st half, 1924	...	...	1,023,650.0	7,905	148,427	883,128.0

As regards the exports, trade with India showed a remarkable increase during the first half of 1929, and that with China, too, increased as compared with the preceding six months, though compared with the corresponding period of 1928 there was a decrease of about half a million yen. The details according to countries are given in the accompanying table :

Countries				*1st half, 1929 (Yen)*	*2nd half, 1928 (Yen)*	*1st half, 1928 (Yen)*
China	...	...	...	4,304,023	3,149,541	4,960,438
Kuantung	...	...	...	406,635	300,770	469,942
Hongkong	...	...	...	1,246,152	1,402,109	2,792,516
British India		...	...	6,358,500	5,320,697	3,860,374
D. E. I.	...	...	...	383,488	311,374	517,525
Philippines	...	...	...	331,981	245,532	224,620
Siam	...	...	...	—	960	96,328
Egypt	...	...	...	74,161	437,921	181,019
Others	...	...	...	860,383	1,102,210	521,029
Totals	...	...	...	13,965,323	12,271,114	13,623,791

The Cotton Weaving Industry

Reports of 45 members of the Japan Cotton Spinners' Association show that they operated 70,210 looms on the average during the first half of 1929. The semi-annual production of cotton textiles amounted to 762,876,160 yards, the average of production per loom per diem amounting to 67.07 yards. The consumption of cotton yarn totaled 167,448,961 lbs., and the output of waste yarn reached 1,588,431 lbs. On the average, 8,598 male and 34,873 female operatives were engaged in the work per diem.

By way of showing how the domestic consumption of cotton yarn for weaving textiles has increased and how the efficiency has been promoted, the semi-annual output of textiles, average output per loom per day, and consumption of cotton yarn for the last five years will be given in the accompanying table :

Periods				*No. of Companies*	*Textile Output (yards)*	*Output Per loom per diem (yards)*	*Consumption of cotton yarn (lbs.)*
1st half, 1929	...	...	...	45	762,876,160	67.07	167,448,961
2nd half, 1928	...	...	...	45	713.888,056	64.97	157,880,433
1st half, 1928	...	...	...	42	668,146,357	64.73	145,127,792
2nd half, 1927	...	...	...	41	634,571,105	59.56	143,608,424
1st half, 1927	...	...	...	42	660,097,717	62.66	149,558,489
2nd half, 1926	...	...	...	41	635,824,255	61.55	147,287,109
1st half, 1926	...	...	...	40	641,902,699	60.73	147,047,436
2nd half, 1925	...	...	...	39	597,241,605	59.24	141,368,875
1st half, 1925	...	...	...	38	582,283,128	58.47	133,103,793
2nd half, 1924	...	...	...	37	517,817,621	55.26	119,651.618
1st half, 1924	...	...	...	42	513,034,937	54.88	121,367,477

The export of cotton textiles, excluding cotton blanket, cotton handkerchiefs, cotton towel, hosiery, and cotton bags, amounted to 871,528,000 square yards, valued Y.198,738,163 during the first half of 1929. Compared with the preceding six months and the corresponding period of 1928, there were increases both value and quantity, for during the second half of 1928, the quantity and value totaled at 707,427,239 square yards and Y.180,528,000, respectively, while during the first half of 1928, they totaled 711,276,000 square yards and Y.171,688,537, respectively.

Increases were also noted in the import into Japan of foreign cotton textiles, for during the first half of 1929, the quantity and value amounted to Y.8,728,343 square yards and Y.4,984,464, respectively, while the same for the 2nd half of 1928 totaled 5,735,323 square yards and Y.3,791,727, respectively, and that for the first half of 1928 amounted to 6,710,039 square yards and Y.3,642,418, respectively.

In Japan's exports, that to China is the heaviest, followed by British India, Dutch East Indies, and Egypt. In the imports, England heads the list, followed by Switzerland, and France.

Japan imported Y.6,857,095 worth of cotton spinning machinery and Y.529,040 worth of looms during the first half of 1929. Japan re-imported a little more than 400 bales of cotton yarn (calculating 300 kin per bale) valued at Y.111,350, and 322,000 square yards of textiles valued at Y.67,940 during the first half of 1929.

Reports of 56 members of the Japan Cotton Spinners' Association show that their authorized capital totalled Y.503,646,250 of which Y.384,623,852 was paid at the end of their respective first semi-annual business term of 1929 ; their combined reserves stood at Y.247,382,529, and their debentures and loans amounted to Y.123,389,140. Their fixed capital was valued at Y.517,521,782, and the redemption of the fixed capital made was Y.10,563,266. The surplus profits carried forward from the previous business term amounted to Y.48,737,730 (though there were four companies which carried forward into this term from preceding terms the losses amounting to about Y.4,780,000). The net profits made during the first semi-annual business term of 1929 amounted to Y.33,324,482, (though there were four companies which made no profits, and two companies which registered losses amounting to about Y.673,000). The combined dividends declared by these companies totaled Y.26,326,776 though there were 15 companies which declared no dividend, and the percentage of dividends, on the averaged, amounted to 13.7 per cent.

Anglo-Oriental Trade Notes

(From Our London Correspondent)

ONE of the most important avenues for British commerce in pre-war days was the Eastern market, which contained, and still does, enormous possibilities as an outlet for manufactured goods. In the post-war period the same causes which have been hampering British trade in other parts of the world have been reinforced in the Oriental markets by the growing competition from Japan and by the long-drawn-out Chinese civil war.

The Trade Circular of the Royal Bank of Scotland, in reviewing the position in the Far East, states that the hoped-for restoration of peaceful conditions there is very slow in coming, and consequently trade shows little signs of revival. British export trade with Japan still suffers from the aftermath of the financial crisis in that country, the effect of which has naturally been to depreciate her currency and stimulate Japan's activity in the export market. In India trade has been hampered by political agitation, recurrent strikes in the cotton mills, and a diminution in the external purchasing power of the dependency. Middle Eastern trade has suffered from the lower prices of rubber and tin.

Regarding tin, a recent development of note has been the decision to undertake a comprehensive research into the industrial applications of the metal, including its properties as a preventive of corrosion and its economic use in the production of efficient high-speed machine bearings. With this object in view the Tin Industrial Applications Committee has been formed in direct co-operation with the British Non-Ferrous Metals Research Association. The secretary of the committee stated in an interview that although tin is the oldest of all metals to be used as an alloy, no comprehensive research has ever been made into its properties. It was discovered recently, for example, that by mixing a small amount of tin with lead and another non-ferrous metal, the strength of the lead was vastly increased, as was also its resistance to corrosion and cracking. American and British users of tin are taking an active interest in the new committee, which is in close touch with many of the principal tin-consuming industries in the United States, as well as with the leading Malayan producers.

The discussion of Chinese affairs at the fifth congress of the International Chamber of Commerce, recently held in Amsterdam, had to be curtailed and was therefore less fruitful than had been anticipated. Nevertheless, some valuable results were obtained. Apart from the fact that Chinese delegates expressed their intention of forming a national committee so that China may become a member of the chamber (which, if put into effect, will supply a much-needed link between Chinese and Western business men) much was learnt regarding China's attitude towards financial and judicial questions.

German trade in China was indirectly referred to, it being mentioned that Germans no longer enjoy extra-territorial rights. The implication was that their trade prospered notwithstanding. It is often forgotten that the bulk of German trade with China is done through Hongkong, Shanghai, and Tientsin, where it enjoys the benefits which other foreign trade derives from the existing status. Thus, most of Germany's trade with China is financed through foreign banks, whose transactions and funds are immune from Chinese official inquisition, surveillance, or control—such as was recently displayed when the Nanking Government in July, 1928, forced the Bank of China at Tientsin to transfer to its account $173,000 deposited in the name of the foreign and Chinese district inspectors of the Salt administration, without the consent or signature of the depositors. Further, the sale of German goods does not involve German residence in the interior, and the number of Germans living there is small. Chinese take the goods into the interior and also bring down the exports destined for Germany. Thus, although Germans have ceased to enjoy extraterritorial rights, their direct contact with China's judicial system is slight and takes place chiefly under conditions which render it comparatively safe.

A very interesting paper on trade and politics in Sinkiang (Chinese Turkestan) was recently read before the Central Asian Society in London by W. Bosshard, of Zurich, member of the German Central Asian Mission to Ladakh, Western Tibet. Mr. Bosshard said that he had come to the conclusion that, politically, England's position had been considerably weakened during the last few years ; but she still held a strong position in Central Asia in comparison with her old rival, Russia. Yet the question remains as to what steps Britain will take should extraterritoriality go. Commercially speaking, India had a great chance during and after the War. At that time had trade been in proper hands it would have obtained a sure footing, and would have developed largely. Dealings with India, however, are rapidly losing ground, and probably will soon die if no measures are taken to revive British and European trade.

Mr. Bosshard expressed the opinion that Chinese Turkestan with its great rural wealth could be easily developed, and that a most interesting and profitable trade could be done with India to the great advantage of China itself. He has closely studied the most important markets and gathered much information, and, taking into consideration the great desire of the new Nanking Government to establish and develop foreign relations and trade, he firmly believes that Sinkiang will play in the future—when communications between different countries are made shorter—a more important part.

On the other hand, Soviet Russia, with her already great trading influence, may gain a political hegemony over Central Asia and succeed in her attempt to introduce Bolshevism into Asia. As regards the Chinese, all their talk of unequal or equal treaties is a mere farce, he declared, for the Chinese never intend to give another race the same rights enjoyed by their own people in foreign countries. They might agree on certain points, so far as the big commercial centers are concerned, but there never will be any equality in Central Asia so long as the Chinese are not compelled either by military force or other pressure to come down from their high and unapproachable seat, and accept and guarantee equal treaties such as exist between civilized nations.

The Electrical Industry in Japan

By J. WALTON, A. Amer.I.E.E., A.M.C.T.

(This article was read as a paper before the M.-V. Overseas Association, and received the first prize awarded by the Management for the best paper of the session.)

FROM the electrical standpoint, Japan has been very greatly developed. It has a greater portion of houses illuminated electrically than any other country in the world. Large industries, such as shipyards, steel plants, spinning mills, etc., make extensive use of electricity. The main streets of the larger cities are a blaze of light at night. Illuminated signs are freely used and with the colorful decorations during New Year celebrations the Ginza of Tokyo presents a sight approaching that of Piccadilly or Broadway.

The central portions of the main island are very mountainous and the rainfall is plentiful so that immense water-power resources are available. As the principal industrial load centers of Japan all surround and are relatively close to the principal sources of hydro-electric energy, hydro-electric developments are extremely numerous. The major part of the available water power developments in central Japan are within a circle of about 150 miles diameter. A circle which would include Tokyo, Yokohama, Nagoya, Kyoto, Osaka and Kobe is about 300 miles diameter. Most of the great cities of the country are therefore well within the economic range of high-voltage transmission from the principal hydro-electric possibilities.

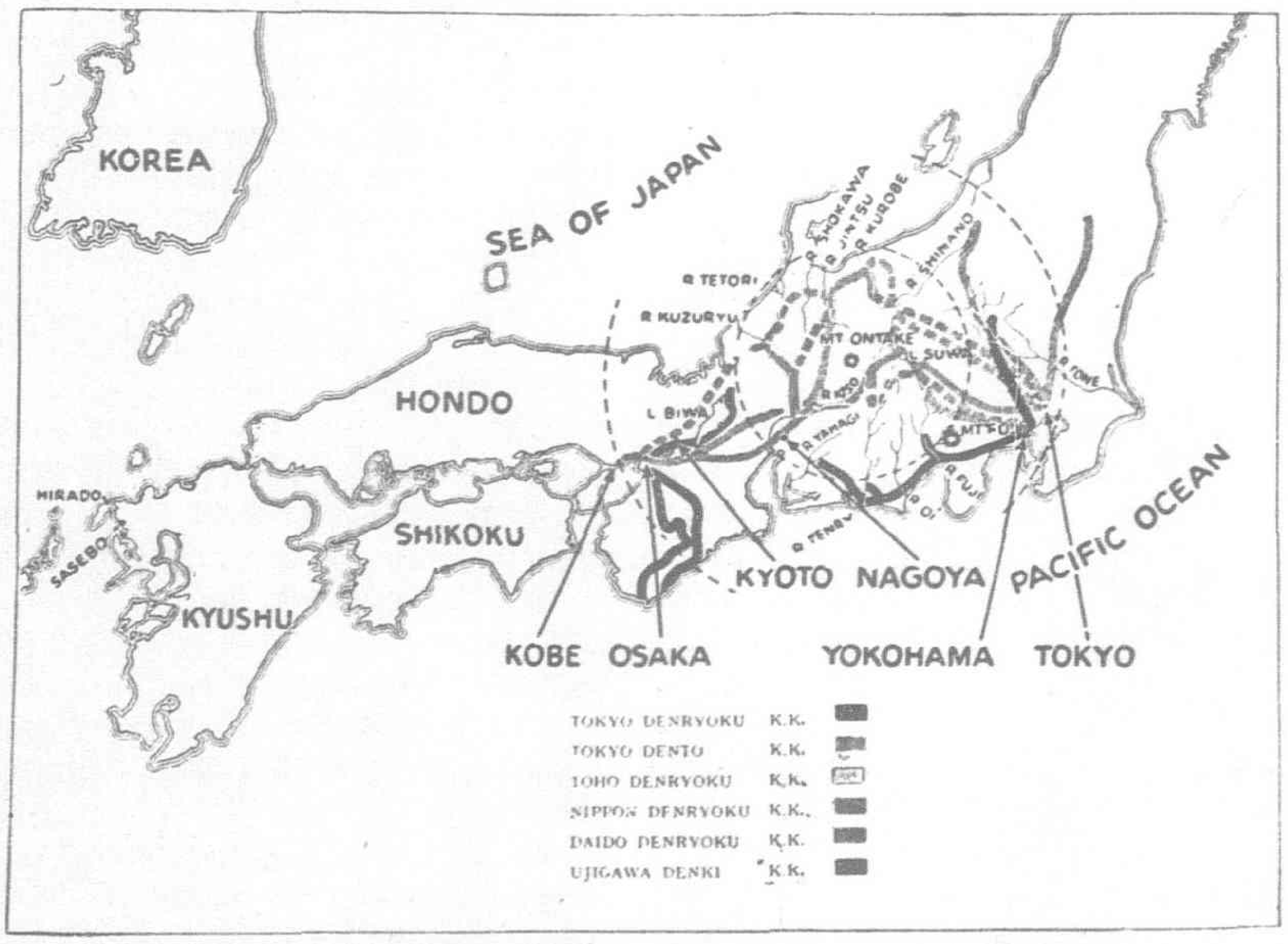


Fig. 1.—Map of Japan Showing the Principal High Voltage Transmission Lines

In 1910, a special research was made into the water power resources of the country in order to foster their development. The power generated by steam and water was equal in amount but thereafter the increase in hydro-power was most rapid and many important water power sites were exploited. At the end of 1919 the completed plants had a capacity of 1,000,000 kW. Of this total 63 per cent. were hydro-electric and 37 per cent. steam-electric. The figures given by the Ministry of Communications on the completion of the investigation in 1923 of the power resources are 6,415,000 h.p. at ordinary stages of water and 14,093,000 h.p. at maximum flow, with the average throughout the year of 11,933,000 h.p. The proportion of the total available on the main island is 7,000,000 kW. at maximum flow, and it is estimated that 5,500,000 kW. can be economically developed. At the end of 1924 the total capacity of hydro-electric plant installed was 1,470,000 kW. and of steam plants 760,000 kW., giving a total of 2,230,000 kW. Besides these there were 1,270,000 kW. of plant under construction, bringing the total up to 3,500,000 kW.

The total capacity of plant installed in Great Britain at the end of 1924-25 was about 4,300,000 kW., of which 90 per cent. was steam driven plant. It is difficult to obtain accurate and complete data of the power possibilities of any country and Japan is no exception. The official figures to hand in connection with Japan are those up to 1924 and for this reason comparisons are made for that period. Where figures of value are given, the Yen values have been converted into pounds sterling.

Although a fair grade of coal is found in Kyushu, near the south-western tip of the main island, the coal is not so plentiful as in Great Britain. Thus it is readily understood why Japan is essentially a hydro-electric country and Great Britain a steam country.

Mountains of eternal snow are not a feature of Japan. Many of the loftiest peaks are heavily mantled with snow from October to late spring, but summer soon melts most of it, and leaves streaks and patches. The distance from the source of the rivers to the sea is in most cases short so that the drop is quite rapid. The Tenryu is one of the finest rivers for power development. At the upper end of this river is Lake Suwa which forms a natural reservoir. There are about ten sites suitable for power development, having a total capacity of 250,000 kW. The total drop from Station No. 1 to Station No. 10 is 1,528 feet, in a distance of 61 miles, or an average drop of 25 feet per mile. The volume of water is so constant that the minimum run-off for 11 months can be taken as a basis for power development. This is important since the steam power reserve need only be small. The company granted power concessions on the Tenryu River is the Tenryugawa Denryoka K.K. and the first plant for the scheme was ordered in May of 1927.

In order to give some idea of the electrical position of Japan with that of other countries, the approximate figures are given in Table 1 see below.

The leading power companies of Japan are the following :—

Tokyo Denryoku K.K.
Tokyo Dento K.K.
Toho Denryoku K.K.
Nippon Denryoku K.K.
Daido Denryoku K.K.
Ujigawa Denki K.K.

TABLE I.

Country	Population	People living in Electric Lighted Abodes.	Central Station Customers all kinds.	Total Gen. Rating kW.		Total Energy Generated kW.-Hr.	Units Generated per head of Population
				Fuel.	Hydro.		
Japan	77,000,000	41,300,000	7,800,000	760,000	1,470,000	7,735,000,000	100
Great Britain	46,000,000	8,000,000	1,950,000	4,300,000	(A)	6,022,000,000	130
Australia...	5,497,000	1,980,000	527,000	560,000	(A)	1,308,000,000	237
New Zealand	1,219,000	82,400	124,700	35,000	30,400	217,000,000	179
U.S.A.	112,664,000	57,600,000	14,377,000	13,000,000	5,800,000	54,413,000,000	482

(A) Included under fuel-burning plants.

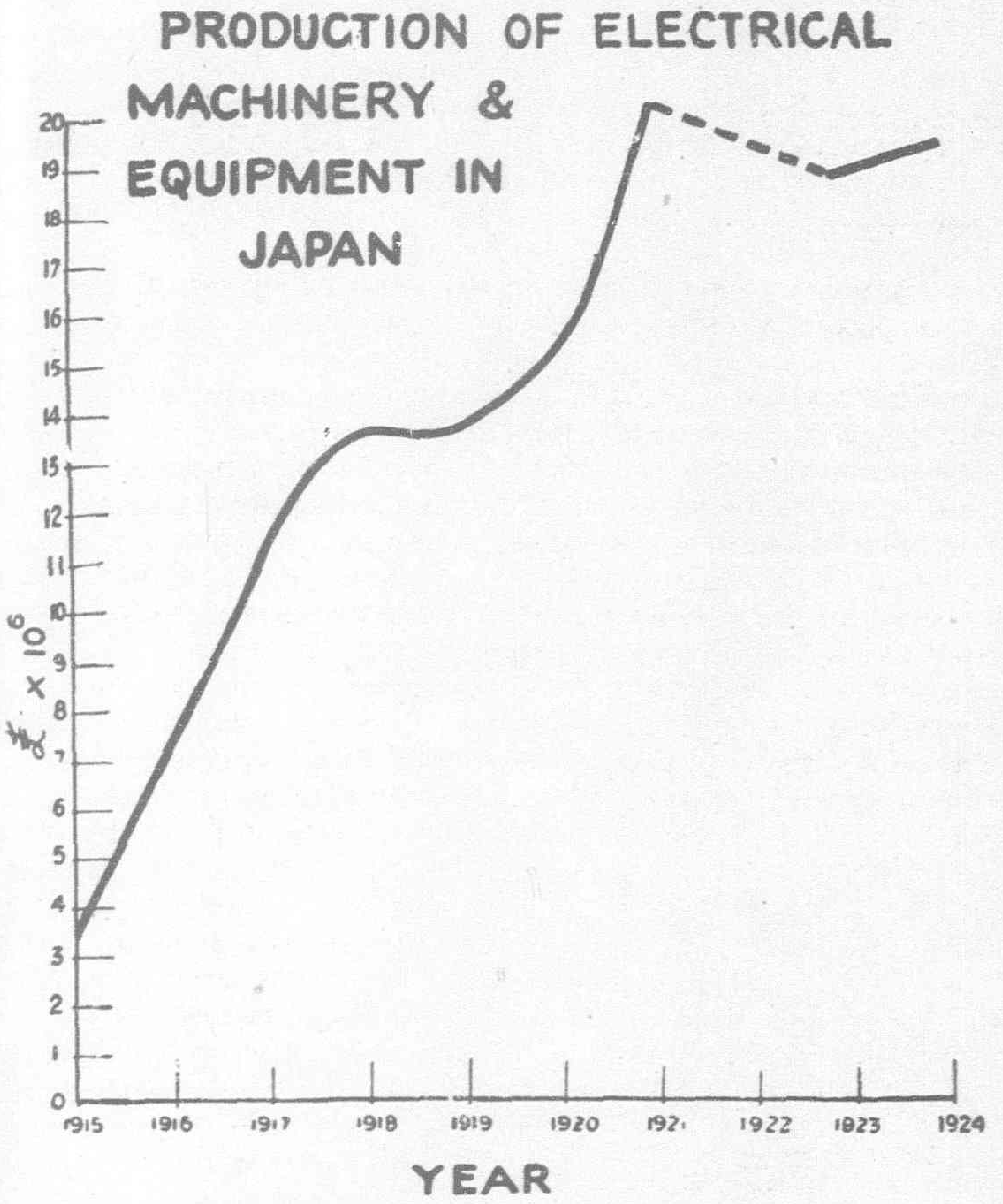


Fig. 2.—The Returns for 1922 are Missing, as the Records were Lost on Account of the Earthquake

These companies own many of the smaller concerns and operate a large amount of plant. Different power companies have water power rights on the same rivers, with the result that duplication of the transmission lines exist from the hydro-stations to the large cities. The voltage of transmission of the main lines is 154,000 and 77,000 volts. One of the companies is considering a voltage of 220,000 volts for a proposed new line. The principal transmission lines of the above companies are shown on the map of Japan.

It will be noted that the main power companies feed into Tokyo and Osaka and the surrounding districts. Since Tokyo area uses 50 cycle supply and the Osaka area 60 cycle supply, provision is made for supplying current to either area. Most of the plant is designed for either 50 or 60 cycle operation. Frequency changers are sometimes used and a 15,000 kVA. set manufactured by us is installed in the Momeyama Station of the Daido Denryoku Co. There has been a tendency lately for the amalgamation and interconnection oft he large power companies. It is obvious that companies supplying the same territory create competition and each strives to obtain contracts for the supply of power by cutting prices. One of the most important amalgamations is that of the Tokyo Denryoku and Tokyo Dento lately carried out.

The power companies have constructed large power stations at a rapid rate, with the result that the growth of power available has increased at a greater rate than the demand. A power investigation committee was organized by the leading power companies to consider the disposal of the surplus power. One of the main objects of the committee is to try and prevent the erection of steam power plants by such as railway companies. It is argued that railway companies erect steam power plants in reserve for the winter season when the water is low but actually the power companies even at low water can call upon their steam reserves.

The rules in Japan call for standby equal to the largest set in the station. If, however, company has a number of stations, standby plant equal to the largest set on the whole of the system need only be available. Actually the standby is not so necessary as would seem and with the present state of affairs there is more generating plant than necessary, but construction still continues.

Before a power station can be erected in Japan, it is necessary to obtain sanction of the Ministry of Communications in accordance with the Electric Enterprises Law. Licences for water power development are given by the Governors of the Prefectures with the approval of both the Ministry of Communications and Home Affairs. Before putting plant into commission, tests are made by the Government inspectors and the plant must satisfy the Teishinsho (Japanese Government) Electricity Regulations. It is very common practice for Japanese engineers to specify that the plant must be in accordance with A.I.E.E. or B.E.S.A. rules. A difference between the B.E.S.A. rules and the Teishinsho rules in the section of pressure tests, is that instead of the usual 2½ times normal pressure for one minute, the Teishinsho rules call for 1½ times for ten minutes.

There is a marked difference between British stations and Japanese stations in the arrangement of switchgear. Interlocked totally enclosed cubicle gear is not installed in Japan. Most frequently the switchgear is arranged on the open principle without enclosure or screens. If the gear is mounted in stonework cubicles, the front is left open, and doors fitted with locks and keys are not used. Outdoor switchgear is universal above 33,000 volts. There are some very large and modern well designed outdoor switching stations in the country.

Mention has already been made of the large number of houses illuminated electrically. The byelaws of the cities enforce electric lighting in houses. Even in the remote country villages electric light is used. This has no doubt been possible to a large extent due to the cheap manner in which the work is carried out. Pole mounted transformers are used to transform from the H. T. lines (usually 11,000 volts) to the usual lighting voltages. Even in the cities, overhead 11,000 volt lines are carried through main streets. It is quite usual to find a wood pole structure at a street corner of a busy thoroughfare, used to support the various lines branching in different directions and, in addition, support a step-down transformer from which leads are taken into the immediate buildings. The leading-in cables are taken through porcelain bushings. The internal wiring is carried out very often in an elementary manner. Flexible cable is run across the ceiling. Tumbler switches are not used in most of the houses and smaller buildings. It is necessary to reach up to the lamp socket, which is provided with a thumb switch. Sometimes the light is switched on or off by turning the lamp on its socket. All lamps have screwed caps instead of bayonet caps. Law requires that a light be fixed above a door or gate which opens on to the street. The charge of this is separate from the other lamps and is at a fixed rate of about one shilling per month. Since the less important roads have no other lights than that given by these lamps outside the houses, some roads are badly illuminated. Incidentally, this is a very cheap form of road lighting, since it is paid for by the residents.

Charges for electric lighting are either on a fixed charge per month or by meter. The average charge for electric light is 1s. 3d. per month per 16 c.p. lamp or 5d. per kW.h. if by meter.

The main railways of Japan are owned and operated by the Railway Bureau of the Imperial Japanese Government. In point of general trustworthiness and equipment they compare very favorably with most progressive countries of the world. There are approximately 7,800 miles included in the Imperial Government railway system. There are quite a number of private owned railways which are electrified. Between Tokyo and Yokohama, which is 18 miles, there is a four track line, over two tracks of which multiple-unit electric cars handle the suburban traffic. The other two tracks are occupied by the steam-hauled traffic of the main line. During 1927 the main line was electrified as far as Kodzu, which is 50 miles from Tokyo. Steam operation over this 50 mile section is now eliminated, except for the long distance trains between Tokyo and Shimonoseki, a distance of 700 miles. The electrification of the main lines is being rapidly carried out and it is very probable that the Imperial Government Railway will electrify all the lines of its system within a reasonably few years. The voltage adopted is 1,500 volts, d.c. The suburban lines around Tokyo have been changed from 600 volts to 1,500 volts. The track is 3 ft. 6 in., so that it is not possible for the trains to be run at the same speeds as in this country.

A scheme of private enterprise to construct an express electric line between Tokyo and Osaka has been put before the Government. If this is carried out, the 300 miles run from Tokyo to Osaka will take only 6⅔ hours, giving a schedule speed of 45 miles per hour. The track gauge proposed is the standard English gauge, *i.e.*, 4ft. 8½ in. An underground railway system in Tokyo is under construction and the first section was opened during the early part of 1927.

The electrification of the railway forms a very important market for power in Central Japan. Mention has been made of the difficulty some of the power companies have of finding a market for their surplus power and the supply of the power for the railways is a desirable market. Since the I.G.R. have started building a large steam station, it would appear that the Government intend generating their own power.

The important power plant of the country has been imported from either Europe or America. A large amount of the railway equipment has been imported from England. There are about forty electric locomotives of English manufacture on the main lines out of the fifty or so at present in operation. It is quite probable that the locomotive required in the future will be manufactured by the Japanese. The large steam-turbo sets are either of English or American manufacture. The waterwheel sets have been obtained from America and Switzerland. Very large transformers have been supplied by the two American concerns. The leading electrical and mechanical engineering companies of the world are represented in Japan and the competition is world-wide and very keen. Nowadays a very serious competitor to the European and American manufacturer is the Japanese manufacturer. The leading manufacturers of power plant are Shibaura, Hitachi and Mitsubishi. Japan has made great progress in the electrical manufacturing field during the last ten years. The curves given in Fig. 2 show the increase in the production of electrical machinery and equipment.

The Tenryugawa company ordered one of the 15,000 kW. waterwheel sets from one of the Japanese concerns and two sets from Europe. This procedure is quite usual, showing that the Japanese engineer has not yet full confidence in the domestic made plant of the above size. Up to the present this is the largest waterwheel set being made by a Japanese manufacturer. Large high voltage transformers of 154,000 volts and oil circuit breakers made in Japan are in operation. It is believed that the largest turbo-alternator set made in Japan is 20,000 kW., Lamp fittings and domestic appliances are made in large quantities. Only a small percentage of this class of apparatus is imported.

There is an import tariff for the import of electrical plant and equipment. The duty imposed is 20 per cent. *ad valorem* in most cases, except for certain classes of equipment, which are charged according to weight. The European and American manufacturer has to include for heavy freight and landing charges, so that with the addition of the duty the foreign manufacturer must produce his plant at about 30 per cent. less than the Japanese. Some of the foreign manufacturers overcome the import tariff by manufacturing certain plant in the country. Certain types of plant, particularly the large machines manufactured by the Japanese, are built under licence and royalty is paid to the foreign manufacturer.

As the electrical industry has developed there has been a great increase in the capital investment. The total authorized capital of all electric enterprises at the end of 1924 was £260,000,000, of which £200,000,000 was paid up. The fixed capital investment was £240,000,000 or more, and loans and debentures outstanding had reached the considerable sum of £70,000,000. Recent developments in the construction of large unit power plants, and the extension of transmission lines over greater distances have called for an expenditure on a greater scale than before, making the recent increase in capital investment conspicuous. Recently, the rate of profit on the paid up capital of electric enterprises has averaged between 11 and 12 per cent. a year.

Recent Far Eastern Contracts Placed in Europe

(From Our London Correspondent)

A NUMBER of interesting Far Eastern contracts have recently been obtained by European engineering firms and are worthy of note here. Outstanding among these is that for two 10,000-ton motor tankers placed with the Rotterdam Drydock Co. by the Stoomvaart Maatschappij "De Maas," Rotterdam (N. V. Phs. van Ommeren's Scheepvaartbedrijb).

Orders have been received from Japan, India, Federated Malay States, Russia, and other countries by the Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, for a new type of self-contained turbo-generator set, the essential features of which are the combination of the turbine and the condenser in one unit, and the direct driving of the condenser pumps, which, in conjunction with other improvements, result in several important advantages. Developed only a short time ago, this combination is finding a ready sale in every branch of industry. The diversity of countries from which orders have been received is striking evidence of the wide application of these turbo-sets, and indicates that a considerable need was anticipated and has been met.

The Cement Marketing Company of London has received an order for 127,000 tons of Portland cement to be used in the construction of the new Singapore naval base which is being carried out for the British Admiralty by Sir John Jackson (Singapore), Ltd.

Among recent big shipping contracts is one placed by the New Zealand Shipping Co. for three motor cargo ships of 9,000 tons each. One will be built by William Beardmore & Co., Ltd., one by Palmers Shipbuilding & Iron Co., and the other by Vickers-Armstrong, Ltd. Each vessel will have a different type of machinery, *viz.*, Sulver, Doxford, and M. A. N. Another important company which is also in the market for new tonnage is the British India Steam Navigation Co., which is understood to have some new cargo vessels under construction and more under consideration. These are all intended to ply Oriental waters.

The India Store Department has awarded to the Patent Axlebox & Foundry Co., Ltd., Wolverhampton, an order for 2,908 steel axleboxes, and to the Tees Side Bridge and Engineering Works, Ltd., Middlesbrough, an order for 285 axleguards. A further railway order is that just placed with Kitson & Co., Ltd., Leeds, for ten locomotive boilers, by the Nizam's Guaranteed State Railways. Yet another is that for tank wagons received by Hurst, Nelson & Co., Motherwell, from the Indian State Railways. The number of wagons ordered has not been disclosed, but the order is valued at £10,080.

Proposals on a large scale for running an underground railway through the heart of Calcutta have recently been worked out at the instance of the Railways Board by an expert sent out from London by Messrs. Merz & McLellan, consulting engineers. The scheme would cost £4,000,000 and would be put forward in conjunction with a project for the electrification of the suburban lines of the East Indian and Eastern Bengal Railway. It is proposed that suburban train passengers should be conveyed to a central underground station at Dalhousie Square without changing at Howrah or Sealdah. There would be a two-minute train service in the rush hours. Calcutta's traffic has now increased to the stage where it is difficult to handle it with the existing machinery. It is not yet certain that the stratification of the soil will permit the construction of an underground railway, but provided the subsoil proves tractable it is expected that the project will be adopted. Each station will be equipped with escalators and automatic ticket-issuing machines. Two tracks will be laid down, one in each direction, and each track will be contained in a separate tube some 14 feet 6 inches in diameter. The electric supply and ventilation details are not yet worked out.

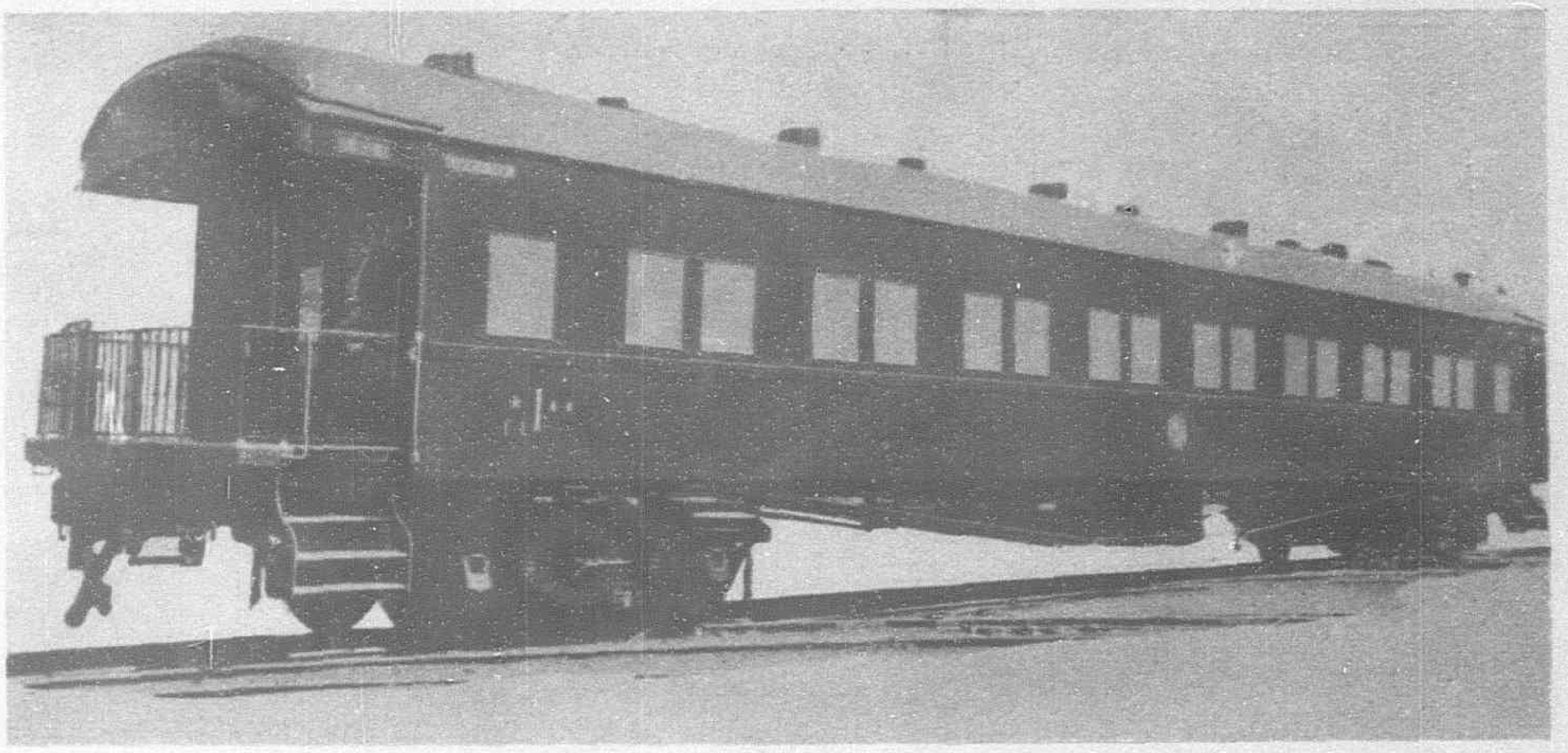
While on the subject of railways, it should also be mentioned that the Eastern Bengal Railway has received sanction from the Railway Board for the construction of the new Tangla-Belsiri-Rangapara railway. The new line will be meter gauge, and will be about 53 miles long. British firms are hopeful of contracts resulting therefrom.

Representatives of four Japanese steelworks arrived in Germany recently for the purpose of negotiating the purchase of plant for the manufacture of wire rod, plates, and sheets. The large black sheet mills which Krupps are supplying to the Kawasaki dockyard

(Continued on page 506).

Locomotives and Passenger Cars for the Kirin-Hailung Railway

On the morning of the 29th of September, the Motor Ship *Beljeanne* quietly nosed into her berth at Dairen with an epoch-making cargo on her deck and in her hold, as, for the first time in the history of the Far East, Locomotives and Passenger cars were brought to these coasts and landed on the dock in a fully erected condition—and practically ready for immediate service.



An Observation Car on the Kirin-Hailung Railway

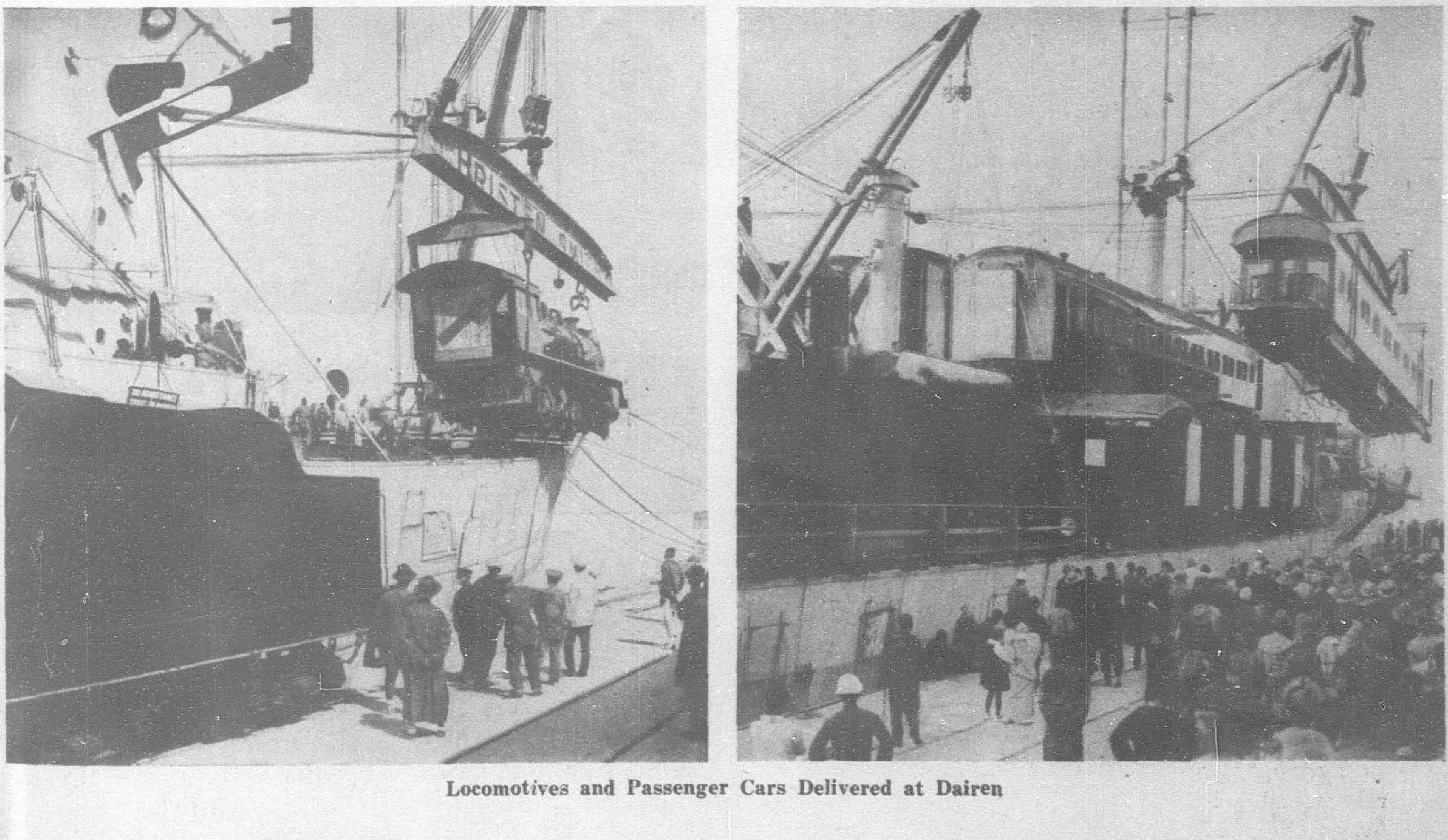
In February of this year the American Locomotive Company, and the American Car & Foundry Company concluded a contract through Messrs Arnhold & Company, Ltd., with the Kirin-Hailung Railway; the former Builder to furnish three Pacific Type Passenger and three Mikado Type Freight Locomotives,—while the latter Company was to furnish 11 Passenger Cars of various classes, including one Observation Car.

It speaks well for the equipment of the steamer that these locomotives and cars, weighing approximately 100 tons and 40 tons respectively, could be loaded by the ship's gear at the Atlantic seaboard,—make the trip of 54 days to Dairen, through typhoon and heavy seas,—unload the cargo and place on the rails 20 feet from the ship's side, delivered in practically a perfect condition.

The three Mikado Type Locomotives are duplicates of engines furnished by the American Locomotive Company to the same Railway, which were placed in service about one year ago. The "Pacifics" are a new type to this Railway—but not to the Chinese Government Railways, for this Builder has furnished a large number of both of these types to various Railways in the Orient in the past few years.

A very distinctive feature of these engines lies in the most thorough interchangeability which has been arranged between the two types, where similar parts and details subject to replacement through natural wear or other causes are the same in both types. This feature takes in such items as the Boilers (including tubes, flues, fireboxes, etc, etc.), Cylinders,—and a multitude of parts of the running gear, which are identical in the two types. This feature of design has for years been the policy of the American Locomotive Company in the building of locomotives for the foreign market, where allowed a free hand in the design; and was adopted for the purpose of assisting the Railways to reduce to the minimum the amount of spare parts to be carried in the Stores stocks, and to reduce the cost, as well as the time, for the necessary maintenance of the engines. To the consumers, far from the source of the supply of such spare parts which must be purchased

(Continued on page 510).

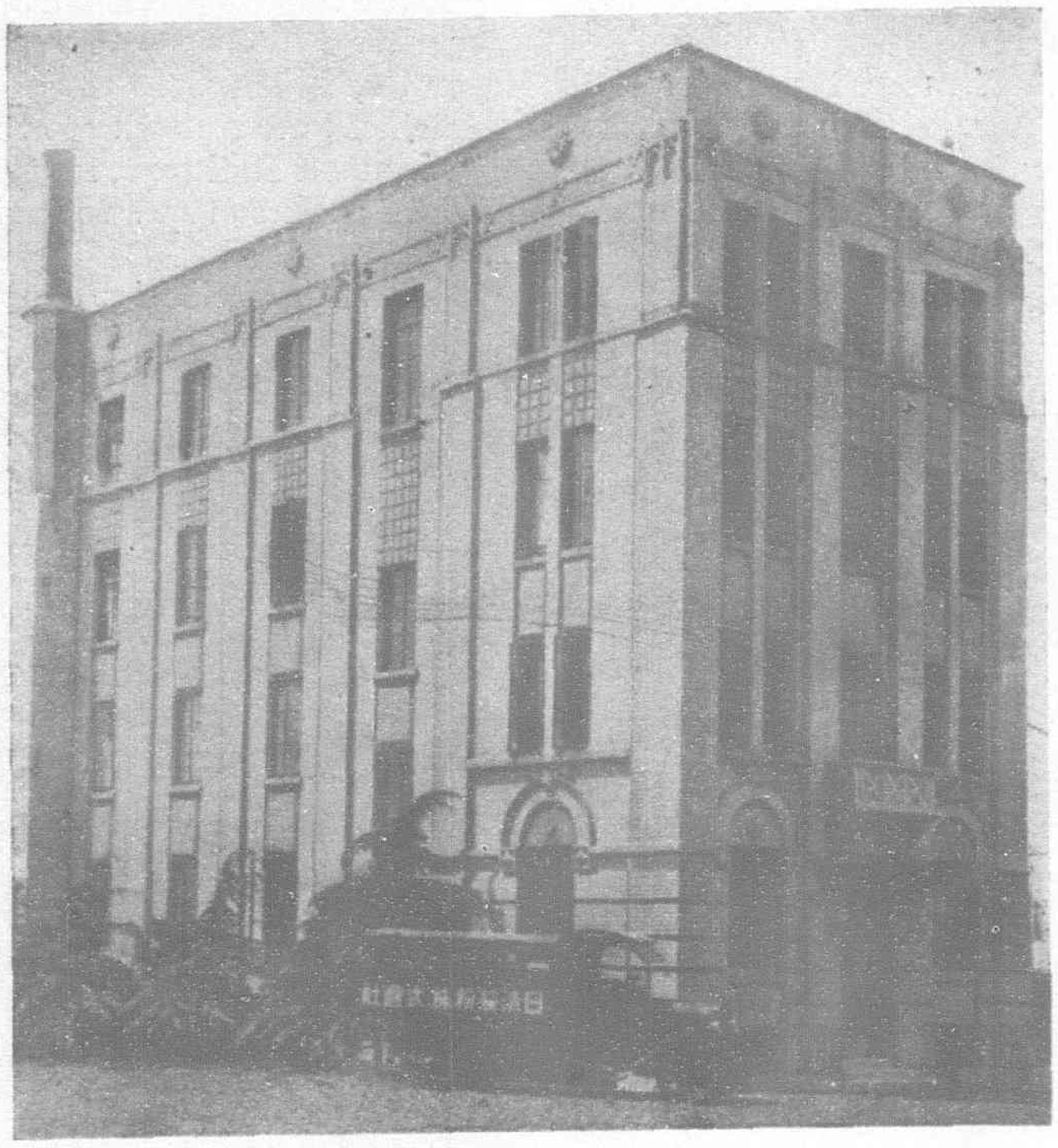


Locomotives and Passenger Cars Delivered at Dairen

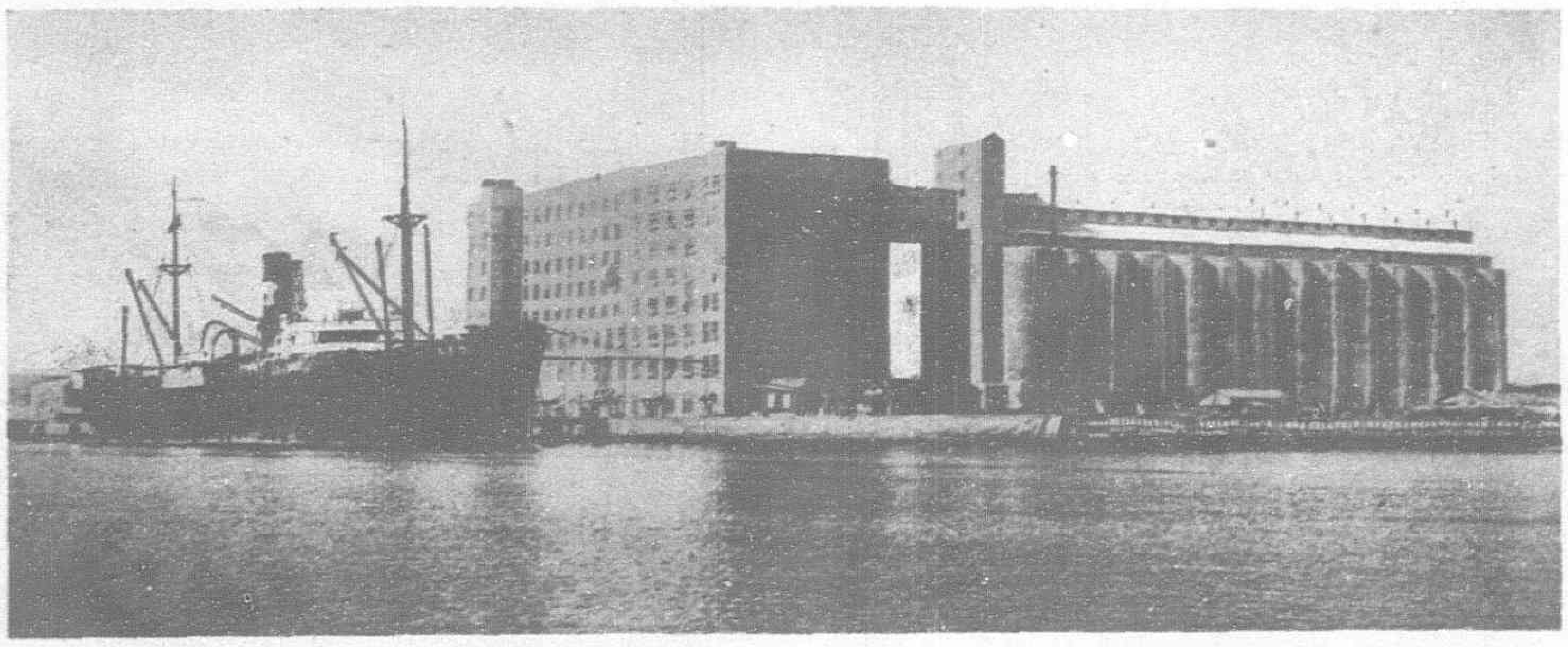
The Nisshin Flour Milling Co., Ltd.

By K. MASUDA

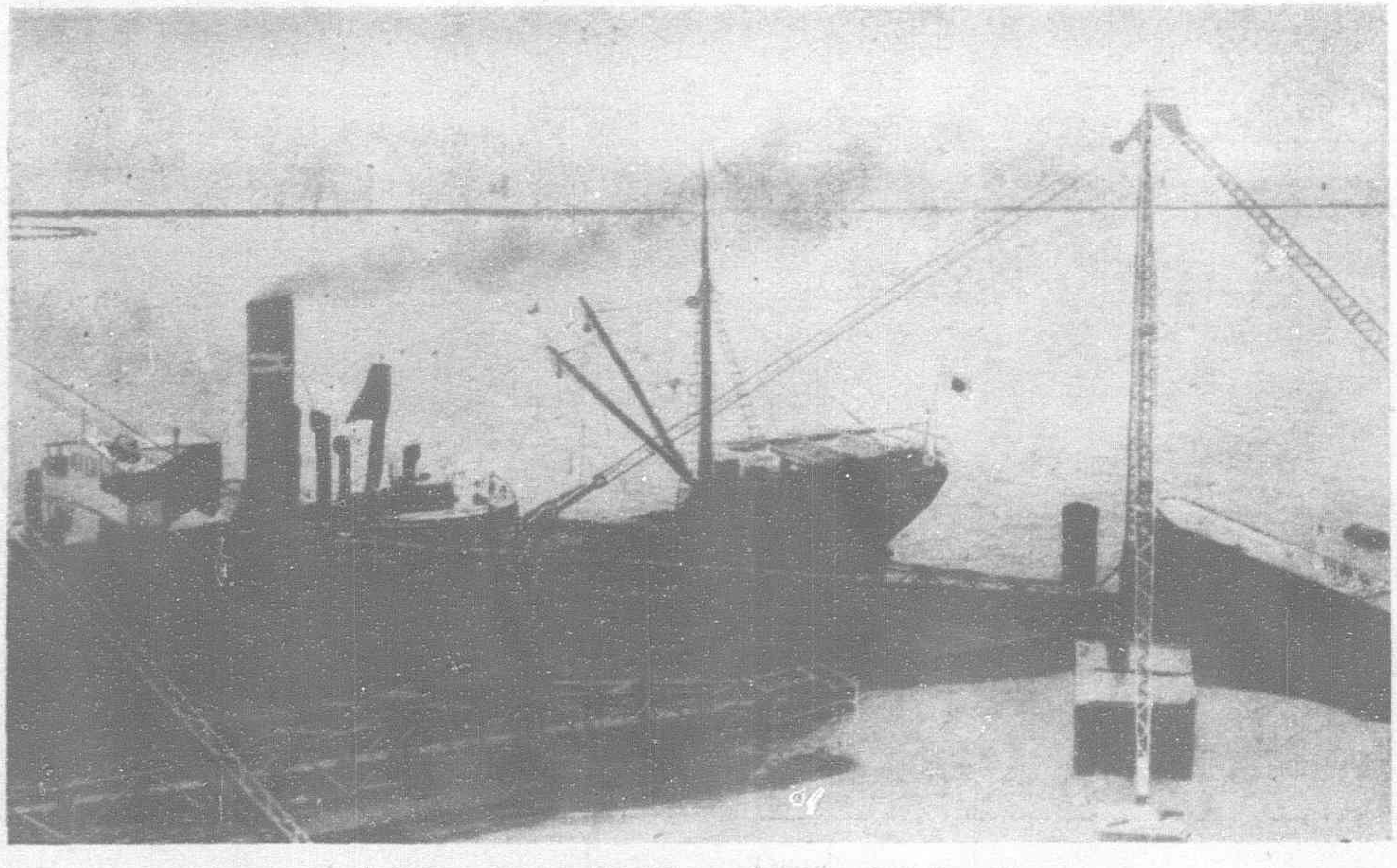
The Nisshin Flour Milling Company, one of the biggest flour manufacturing companies in Japan is capitalized at Y.12,330,000 of which Y.9,402,000 has been paid up. In 1900, it was known as the Tatebayashi Flour Milling Company with a capital of Y.30,000 and a productive capacity of 50 barrels per day. However, as a result of the Russo-Japanese War which demanded a large quantity of flour for military provision, this industry rapidly expanded. After the war, in 1907, the Tatebayashi amalgamated with the Nisshin Flour Milling Company which was then operated in Yokohama had a larger capital. The amalgamation resulted in The Nisshin Flour Milling Company Ltd. (Japan and China), with which this article deals. In 1914, when the Great War broke out there was an enormous call for flour. Flour milling became very active. In consequence, the company established its branch mill in Nagoya in order to meet the increasing demand. Since then the company established flour mills in the more important cities throughout the country. At present, this company operates 12 flour mills, namely, Tatebayashi, Yokohama, Utsunomiya, Mito, Takasaki, Sano, Nagoya, Kobe, Okayama, Sakade, Tosu and Tsurumi. The aggregated daily capacity of these mills is 21,000 barrels. Among the above mentioned mills, Tsurumi ranks first not only in its productive capacity, but in its equipment.



Head Office of the Misshin Flour Milling Co., at Tokyo



General View of the Tsurumi Flour Mill



A Ship Alongside Quay Ready for Loading

The Tsurumi Flour Mill

The Tsurumi Flour Mill is situated on the reclaimed area of the new industrial center of Tsurumi. The location of the mill is ideal. In addition to adequate harbor facilities, it has direct connection with the main line of the Japanese State Railways. The site consists of about 20,000 "tsubo" of level ground. It faces Tokyo Bay and is directly opposite to the Port of Yokohama. Direct small boat service is available from Yokohama to two sides of the property. It is quite probable that in the future ocean-going steamers may be brought alongside, and complete docking, loading and unloading facilities installed. On the land side, a railroad siding connecting with the two stations, Kawasaki and Tsurumi, is available.

In 1926, operation for output of 2,500 barrels was started, and in July, 1928, the second stage of the construction work of the plant for a capacity of 4,500 barrels was completed. The mill, therefore, has a daily capacity of 7,000 barrels.

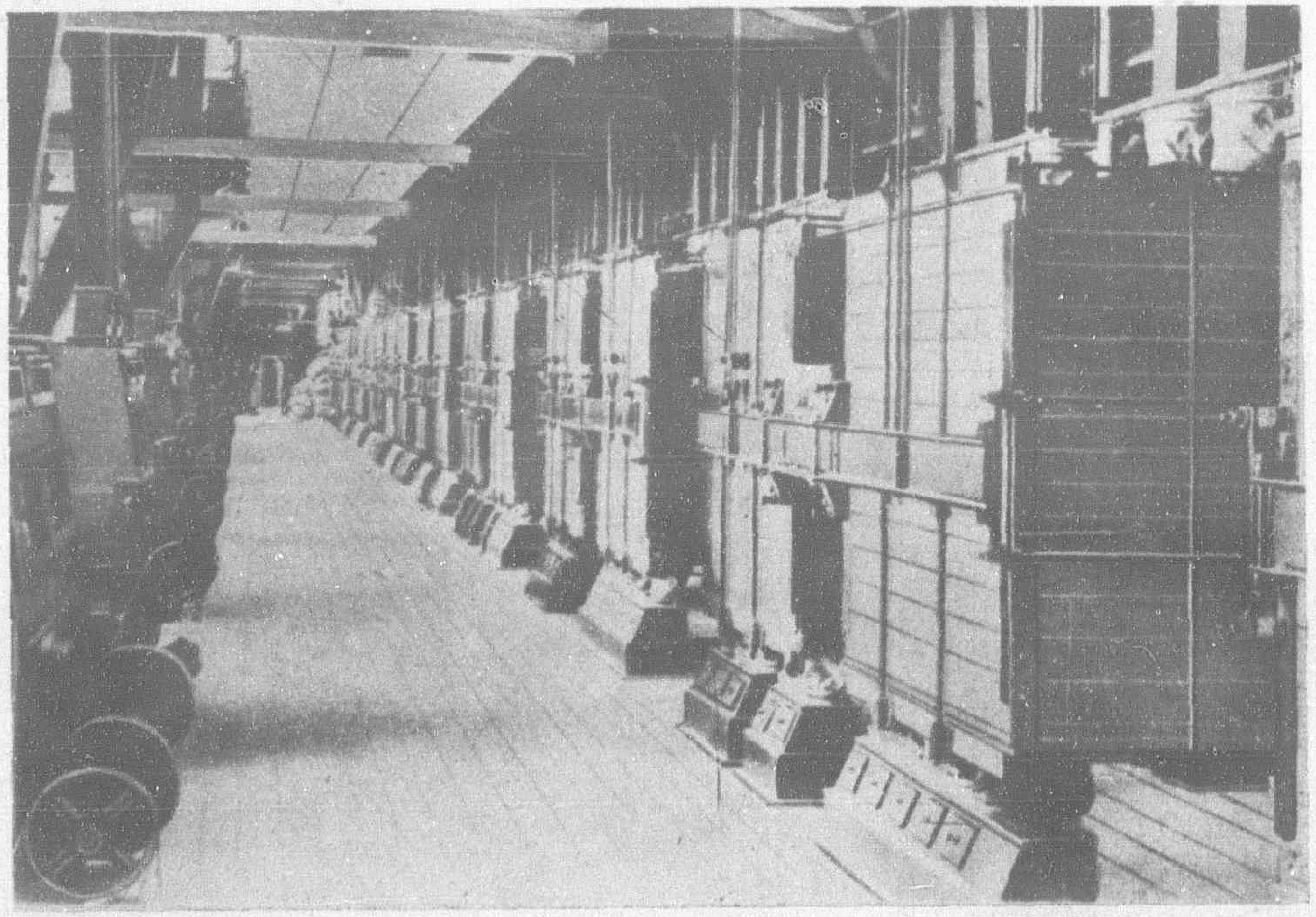
The mill building is approximately 90 by 270-ft. in area and is eight stories in height. It is of reinforced concrete construction and is fire and earthquake proof.

For the purpose of storing wheat, a silo is provided in the premises. Forty-two tanks of cylindrical type are placed in three rows, with 14 in one row. The work is at present in progress to install 21 more tanks. As each tank has a capacity to hold 1,000 tons, 60,000 tons of wheat can be stored there. The wheat stored there supplies the mill in the premises and other mills of this company.

For unloading the wheat in bulk from ship, the modern methods are employed. Adjacent to the silo, there is a pump room from which a big iron pipe, 90-ft. in length, runs to a quay. The pipe can be further extended so as to reach the ship alongside. When the pump starts operation, wheat in the ship's hold are pneumatically sucked up first by the receiver at the end of the pipe, and then taken in by a conveyer leading to a mill house. This arrangement is capable of unloading 300 tons of wheat per hour. After refuses are removed by means of separators, they are conveyed to the silo.

Though the process of milling is almost the

Interior of The Tsurumi Flour Mill of The Nisshin Flour Milling Company Ltd.



Sifting Flour

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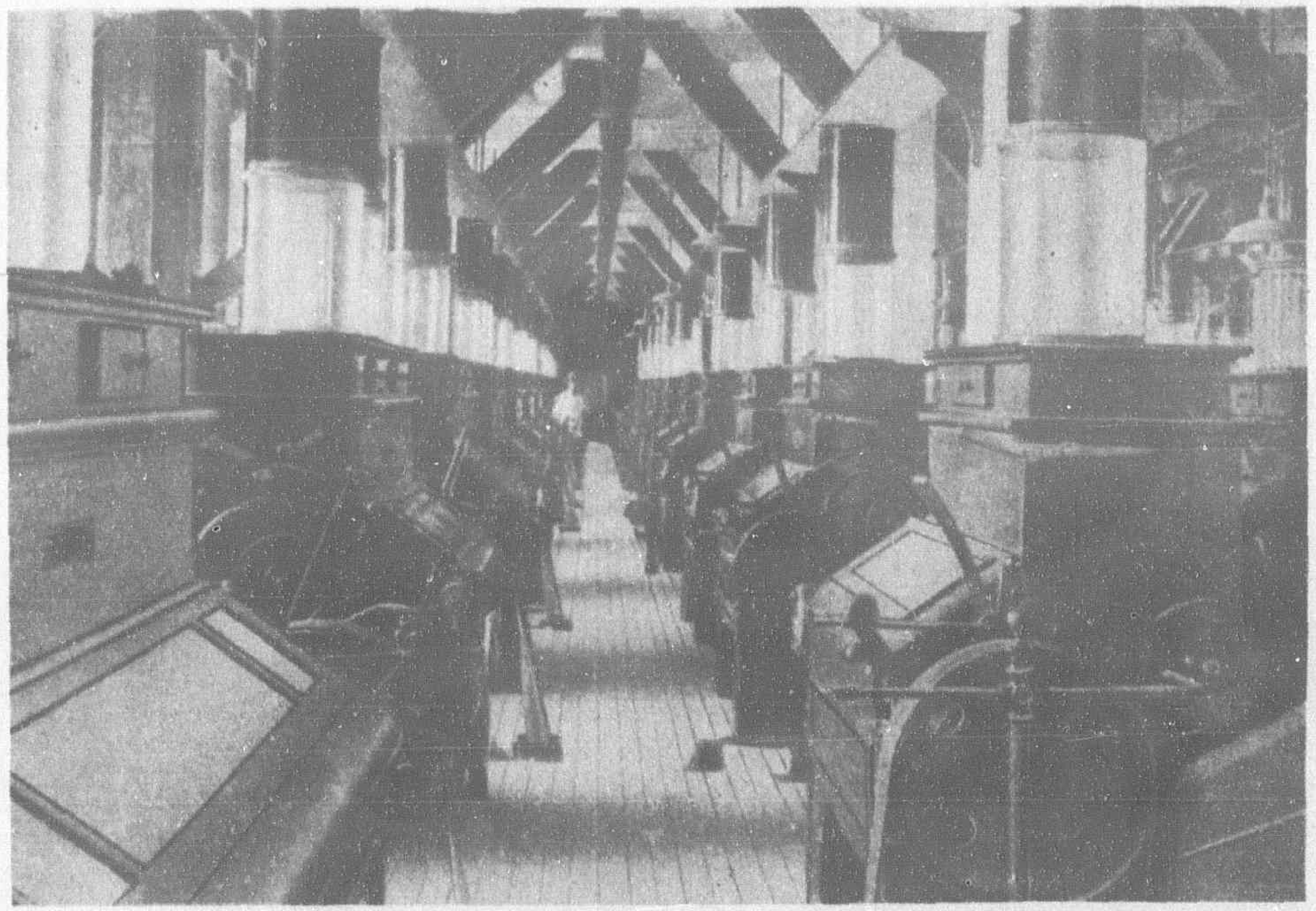
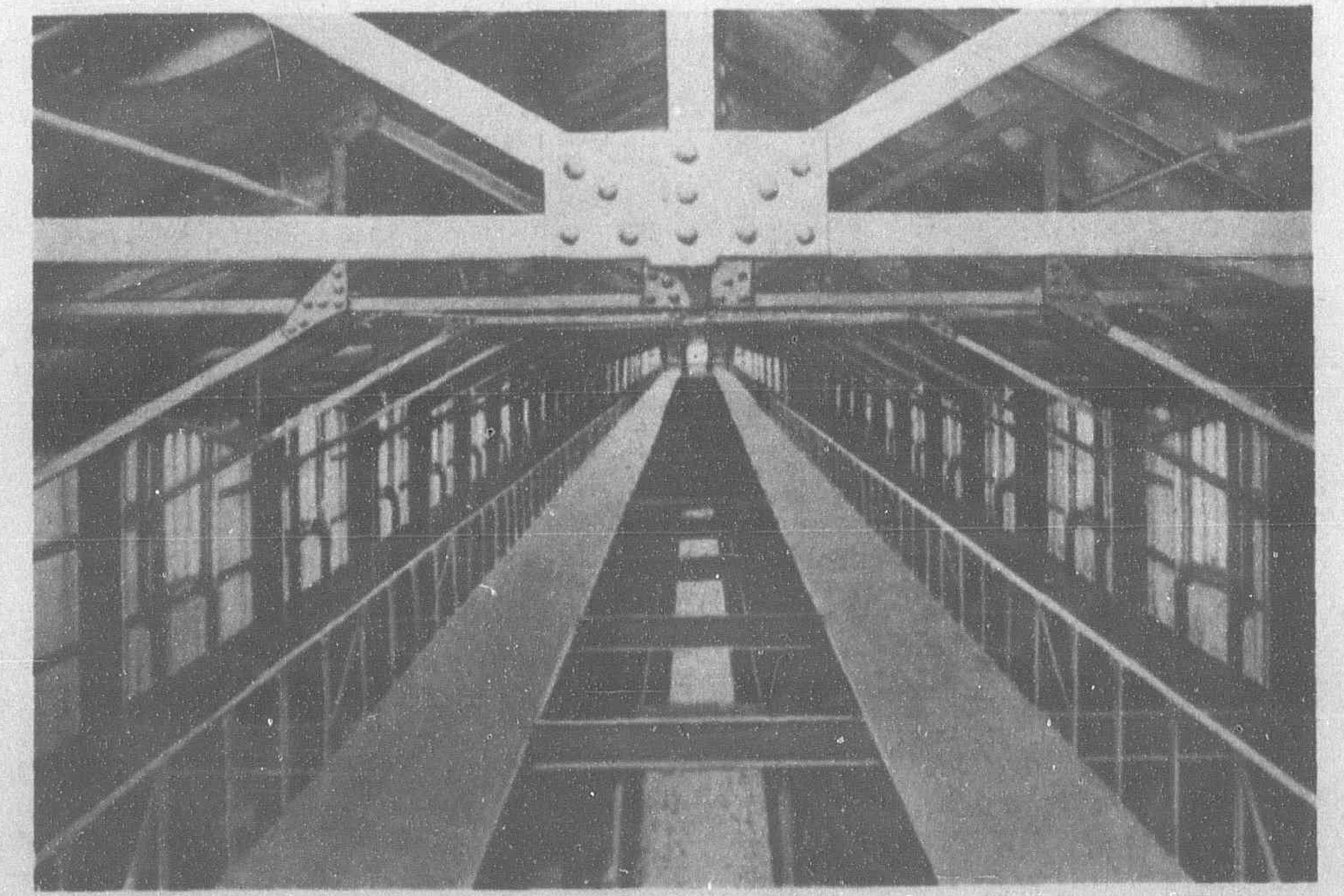


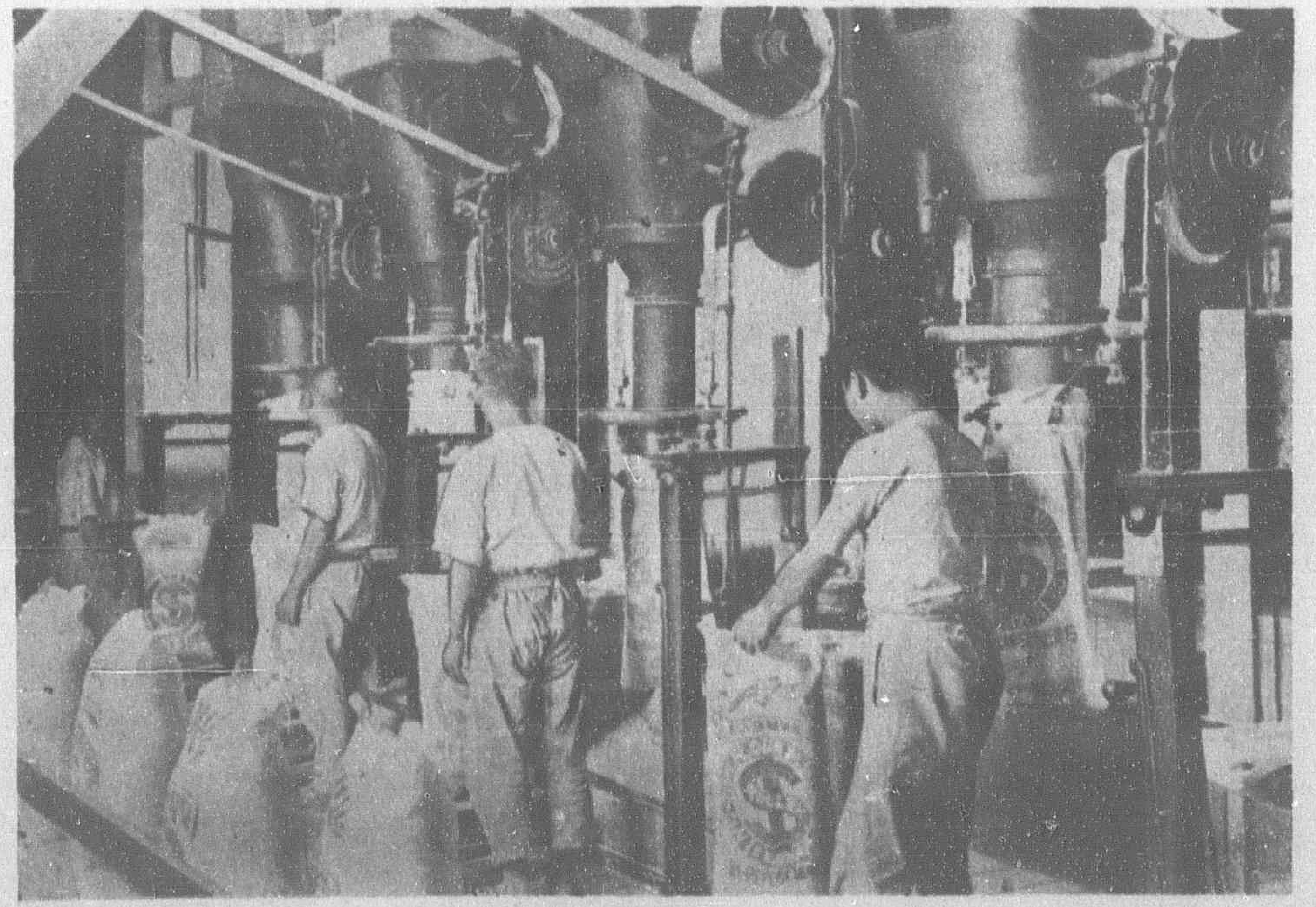
Grinding Flour

2



3

Wheat Conveyer



4

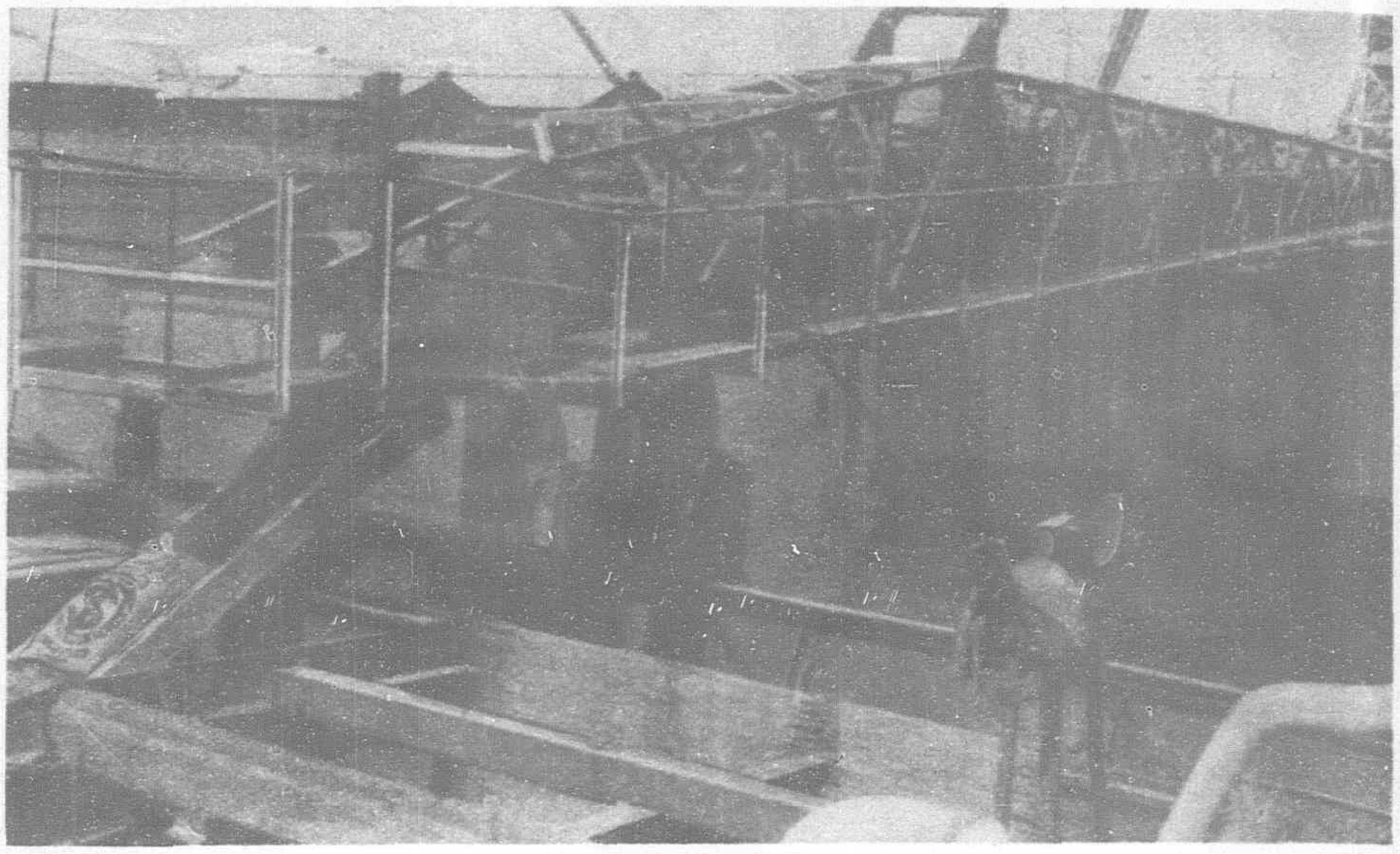
Packing Room

same as that of other companies which adopt the latest methods, the machinery installed in this mill are arranged to conform to the standard of high efficiency. Purifiers, rollers, sifters and other important parts of the equipment are of German make.

Mention may be made also of the sack loader which the mill installs. This arrangement makes it possible to load 5,000 sacks per day on a ship alongside quay.

The product of the Tsurumi Flour Mill is intended for foreign markets including North China. In that part of China, there is a big demand for this product, amounting to an annual consumption of about 25,000,000 sacks, of which the larger portion is supplied by America, Canada and Australia. On the other hand, Japanese flour milling companies, including The Nisshin, shipped 2,380,000 sacks to this market in 1927, and 6,500,000 sacks in 1928.

With its Head Office in Tokyo, the Nisshin Flour Milling Company has 10 business offices at home and abroad, and its business territory covers Japan, Korea, Formosa, China, South Sea Islands, India and a part of Africa. This company is realizing a profitable business, keeping up a dividend of 14 per cent. per annum.



Sack Loader

Recent Far Eastern Contracts Placed in Europe

(Continued from page 502)

will soon be ready and will increase the capacity of the Kawasaki firm by 70,000 tons per annum.

Incidentally, the Graf Zeppelin's successful flight to Tokyo has quickened Germany's interest in Far Eastern affairs and has resulted in the reopening of negotiations between the Berlin Municipality, the Prussian State Government, and the Reich Government for the equipment of the Staaken aerodrome as an airship port. It is stated that the necessary finance—about 1,000,000 marks ($250,000 U.S.) is estimated as the cost of the mooring mast alone—will be provided for in the next budgets.

Air developments are also being pushed ahead in Rangoon, where a Royal Air Force officer has recently been making arrangements for landing grounds at Rangoon, Mloulmein, Tavoy, Victoria Point, and possibly at Mergui and Bassein. He anticipates that the aerodrome at Rangoon will be completed by March next, and possibly earlier, but there is still the need to prepare emergency landing stations at places between Calcutta and Rangoon. These arrangements are apparently being made in connection with the extension of the Indian air mail to Singapore. The British Government has definitely decided to extend the Indian air mail to Rangoon as soon as possible and this has quicken Burmese interest in matters aerial. The general opinion seems to be that flying will be quite practicable., although the air mail might occasionally be subject to delay owing to storms. Recently an R. A. F. flying boat made some experimental flights between Singapore, Rangoon, and Calcutta, for the purpose of studying meteorological conditions during the monsoon period.

In connection with the town's water supply the Rangoon Corporation is examining the Mingaladon Tank Scheme and renewing investigations regarding the Pugyi Forest Scheme with a view to making a detailed comparison between the two projects.

It is announced that greater use is to be made of the waters of the Cauvery River in Southern India. The Madras Government is considering proposals for extending irrigation in the Trichinopoly district, involving the construction of two high-level channels and a North Bank Cauvery canal. The Mysore Government is considering a proposed hydro-electric scheme at Chunchankatte on the Cauvery River, eight miles from Yedatore.

A notable launching which recently took place from the yard of De Schelde Royal Shipbuilding Co., Flushing, was that of the steel single-screw cargo motor vessel *Pœlau Tello*, under construction for the Nederland Steamship Co., Amsterdam, the christening ceremony having been performed by Mrs. Prins, *nee* Duyvis, of Bloemendaal.

The *Pœlau Tello* is a sister ship of the *Pœlau Bras*, launched by the same builders last April, and is the fourth vessel of the *Pœlau* class for the owners' fast cargo service between Europe and the Netherlands East Indies, which, with a mean speed of 14½ knots fully loaded, are among the fastest cargo vessels afloat to-day.

The ship and machinery have built to designs and under the supervision of the owners' technical staff, to the highest class of Lloyd's Register, and to requirements of the Netherlands shipping inspection. With a short forecastle and poop and long bridge, the vessel has a raked stem, characteristic of her class; her allover length is 515 feet 8 inches, length between perpendiculars 490 feet, moulded breadth 61 feet, and moulded depth to upper deck 36 feet 9 inches. Her deadweight capacity on summer freeboard will be about 10,800 tons. Her diesel oil bunkers have a capacity of 1,595 tons.

The upper 'tween deck is adapted for the carriage of native passengers and also contains two rooms for special cargo, and rooms for mails and for explosives. Twenty-five cabin passengers can be carried in seven three-berth and two two-berth cabins on the bridge deck, on which a spacious smokeroom communicates with the promenade deck, enclosed at the forward end by glass screens, the dining-room being on the upper deck.

The propeller is driven by an eight-cylinder two-cycle single-acting Sulzer marine Diesel engine, with cylinders of 820 mm. diameter by 1,440 mm. stroke, developing 7,040 shaft p.h. at 100 revolutions per minute. The steering is effected by the Oertz patent streamline rudder.

Edgar Allen & Co., Ltd.

We have received an interesting catalogue from Messrs. Edgar Allen & Co., Ltd., entitled "Maxilvry Patent Malleable Stainless Steel." The first paragraph reads:

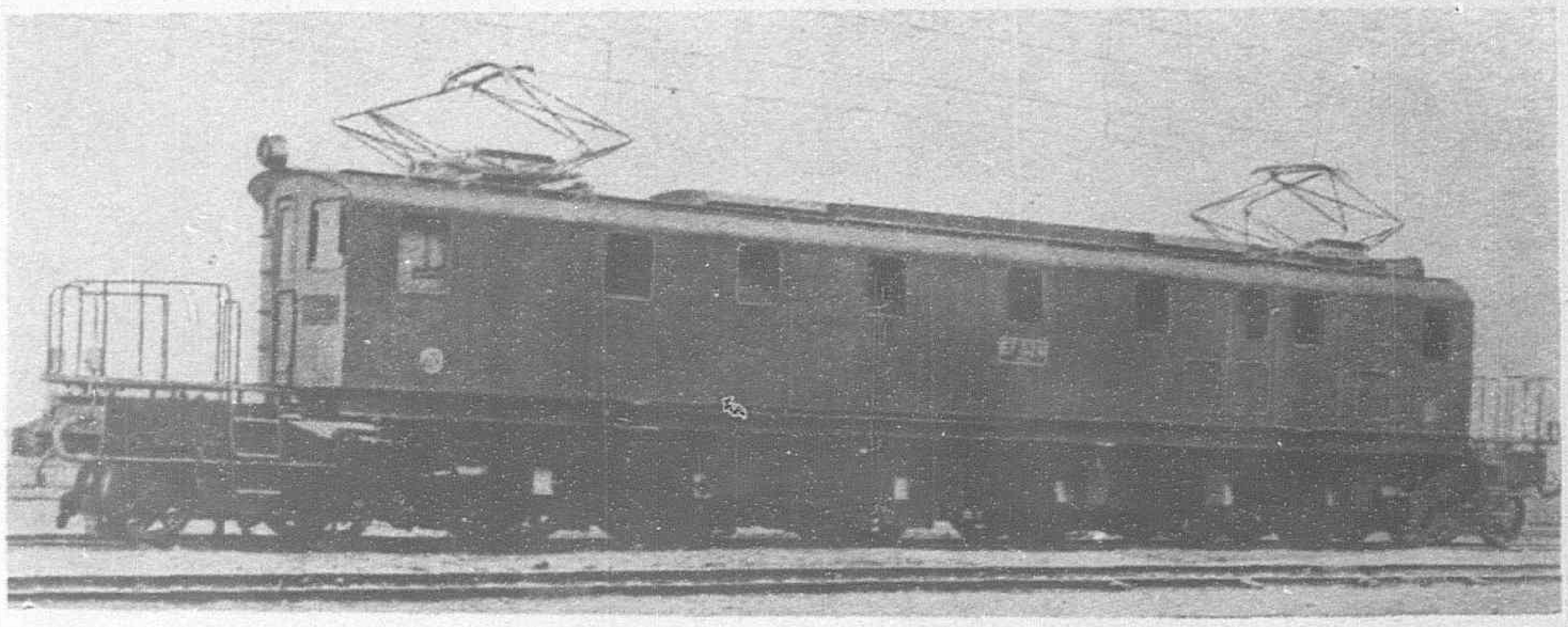
> The first popular application of stainless steel was to the production of table cutlery. Another type, of softer nature, was evolved for stampings and pressings. Maxilvry is more like the latter type, but takes a brighter lustre when polished (hence the name Maxilvry), and is far more resistant to corrosion, etc., than is the ordinary type of stainless iron. It is, in fact, a much more useful stainless material and has a far wider variety of actual and potential applications. One of the earliest industries to recognize its value was the chemical industry. For tanks, linings of retorts, etc., it quickly proved its economy.

Those interested should write to Edgar Allen & Co., Ltd., Sheffield, England.

Japanese-made Electric Locomotives

THE southern coast of Japan, much indented by the sea and most irregular in contour, is in a general way paralleled by the main Tokaido line of the Imperial Government Railway that connects Tokyo in the East with Yokohama, Nagoya, Osaka, Kobe and so on to the port of Shimonoseki at the western tip of the mainland.

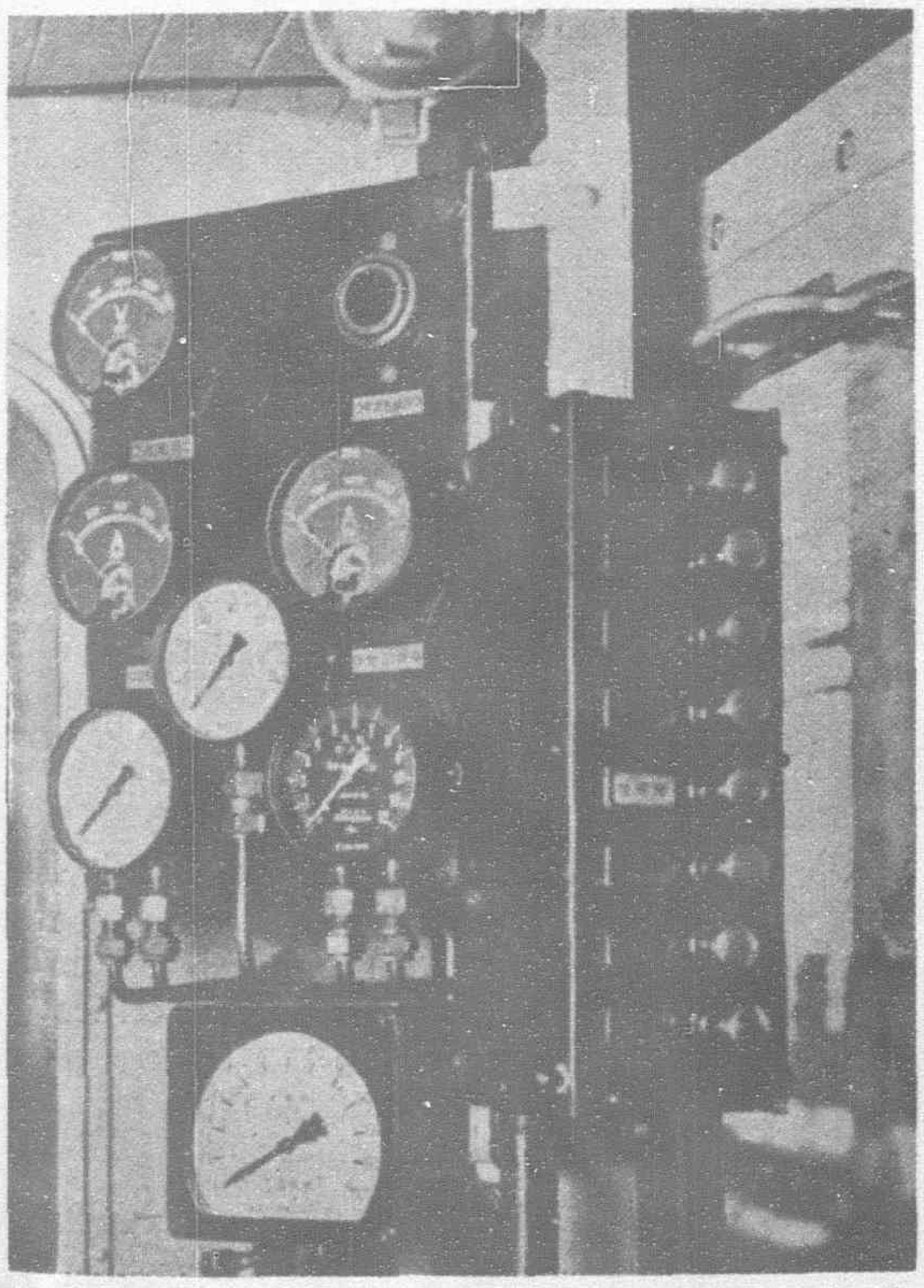
Beginning in 1912 with the electrification of one of its mountain sections, through the Usui Pass, 3,000 feet above sea level, the state railways of Japan have been following a long term program for the introduction of electric traction to replace steam locomotives. In 1915, Yokohama was connected with Tokyo by a double track electric road. From this point electrification has since been carried along the main Tokaido line as far as Kodzu that lies to the south of Fujiama, about 50 miles from Tokyo, and from which, branch lines have been electrically equipped that serve two peninsulars with terminals respectively at Yokosuka and Atami, which are popular summer resorts.



Electric Locomotive of 106 Metric Tons Built by Shibaura Engineering Works, Japan

In selecting electric locomotives, the Japanese government placed orders with leading manufacturers in the United States, England and continental Europe so that they have in operation on this system samples of General Electric, Westinghouse, English Electric and Brown-Boveri locomotives.

Satisfactory as these machines may have proved to be in operation, the Imperial Government was awake to the many advantages of having a local source of supply in the further expansion of their program. Its engineers having had the opportunity of observing and becoming acquainted with the details of occidental practice in locomotive building, drew up their own designs in which were incorporated the outstanding features of the imported locomotives. Specifications were prepared, based on which orders were placed with the Shibaura Engineering Works, a company affiliated with the General Electric Company (U.S.A.) and at its factory in Tsurumi there have been completed two express passenger locomotives for the electrified Tokaido Line. Each weighs 106 metric tons with tractive effort of 9,200 metric tons and will draw a train of 500 metric tons at a speed of 95 kilometers (59 miles) per hour. The trolley voltage is 1,500 volts d-c. There are six 225-kW. 675-volt, series motors with tapped fields, commutating poles and forced ventilation. These run at 680 r.p.m. at full field and 815 r.p.m. at weakened field. An 8-kW. motor driven blower supplies ventilation at 150 cubic meters per minute. Power transmission to the axles is through spring gears. The control is electro-pneumatic, non-automatic, double end. A 2-kW. constant potential motor-generator set and a 58-amp. hour Exide storage battery furnish current for auxiliary control and lighting. High speed circuit breakers and aluminum lightning arresters protect the main circuit.



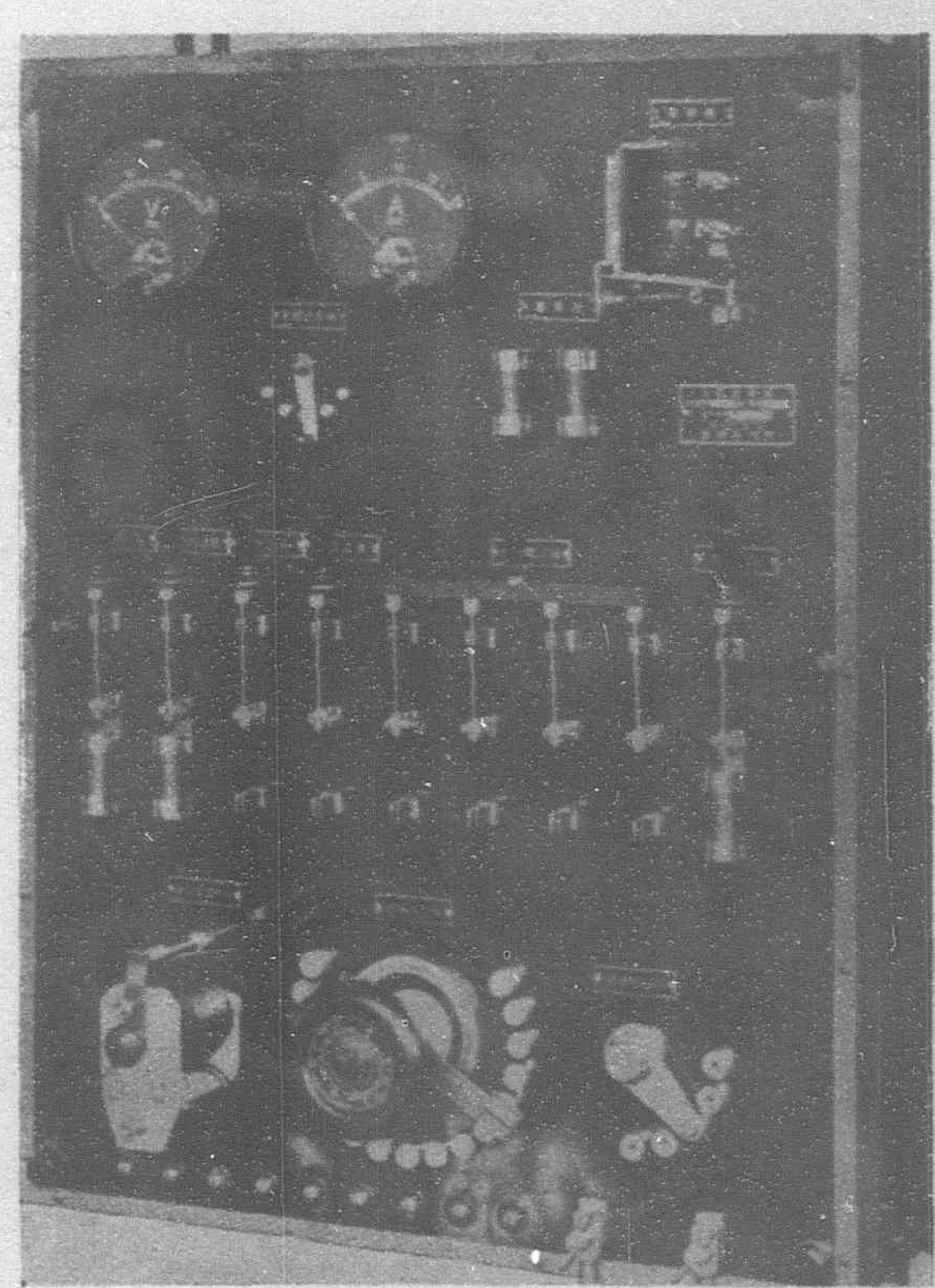
Instruments in the Operator's Compartment of 106-Ton Locomotive

The locomotive body is of the box type and in the central section are located disconnecting switches, high speed circuit breakers, main switch and cutout and reversers. At each end there is an operator's compartment. Between the latter and the central section are respectively the main resistors and the auxiliary apparatus. Each operator's compartment is equipped with main controller, all controlling switches, foot switch for sand, push buttons for lighting, pneumatic brake control and pantograph controlling valves.

The running gear consists of two trucks linked together, each of which has three driving axles and is equipped with a 2-axle leading truck; that is, 4-C+C-4.

The total weight of the locomotive is 106.4 metric tons and the weight on the axles is 79.2 metric tons. The overall length is 21 meters (69 ft.) and the height of the roof is 3.6 meters (12 ft.). Two pantograph trolleys are used and the braking system is Westinghouse air braker, vacuum brakes and hand brakes.

The Japanese government and people take a natural pride in having established within their own country, a source from which they may hereafter as their program expands, equip their electric roads with Japanese-made locomotives that are modern in all respects and based on present-day practice of American and European manufacturers.



Control Panel for Auxiliary Apparatus

Large Vertical Alternators for the Perak River Hydro-Electric Power Company

By reason of the large dimensions and considerable floor space required for the construction and assembly of vertical-shaft alternators for great outputs at slow speeds, the question of workshop capacity is an important consideration. The two works of the English Electric Company allocated to this class of plant, namely Preston and Stafford, are fortunately well equipped for such work, and consequently the Company has been able to accept contracts for a number of machines involving diameters of up to 30 ft. and more.

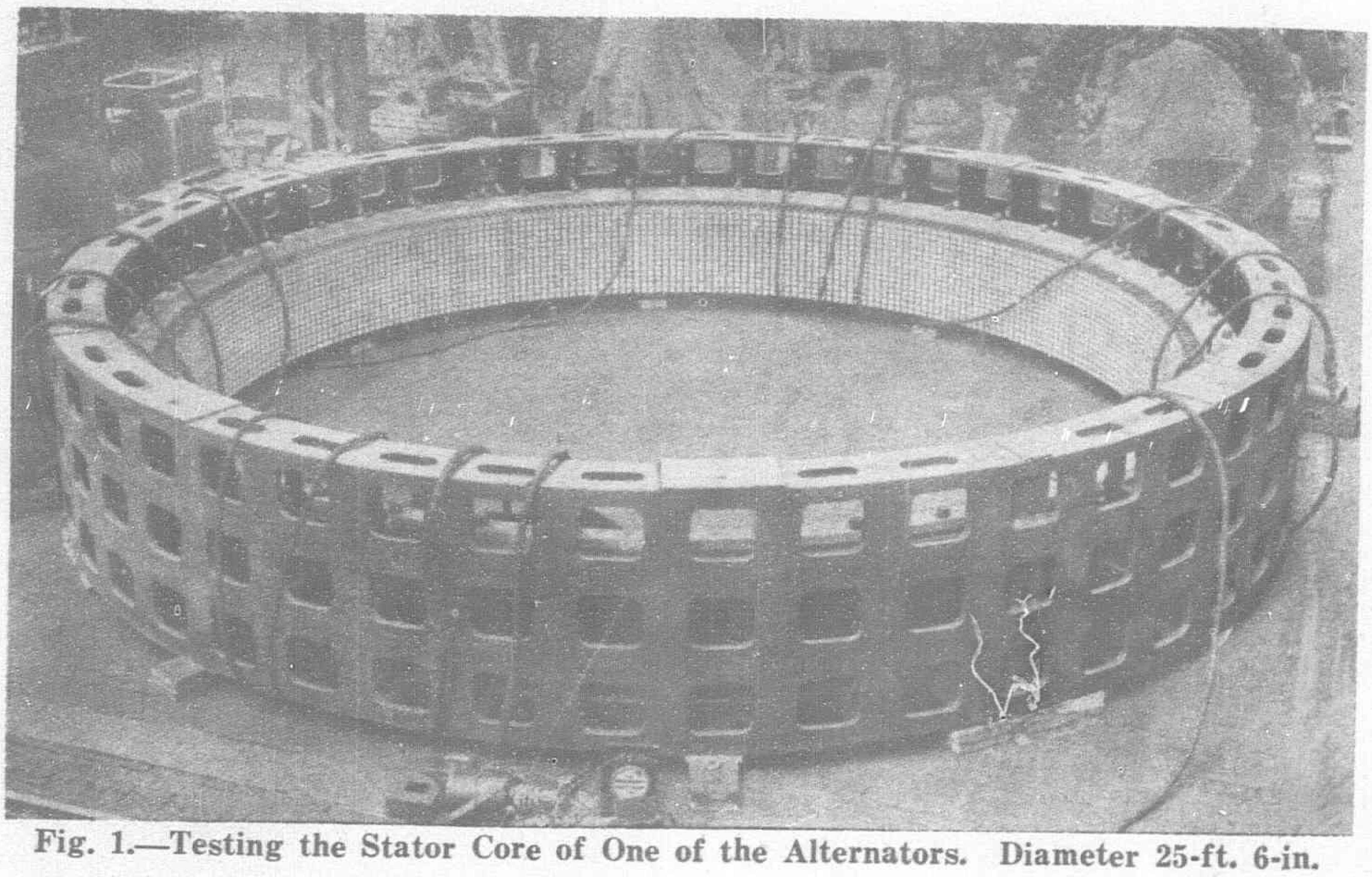


Fig. 1.—Testing the Stator Core of One of the Alternators. Diameter 25-ft. 6-in.

The three alternators which are described in some detail in this article will be installed in the Chenderoh Power Station on the Perak River, in the Federated Malay States, and each will have a normal output of 9,000 kW. when running at 93.75 r.p.m. They are designed to carry continuously an overload of 20 per cent. at .875 power factor, corresponding to a load of 12,350 kVA., and are wound to give a 3-phase, 50-cycle output at a normal pressure of 6,600 volts, but with a range of 6,230 to 6,930 volts.

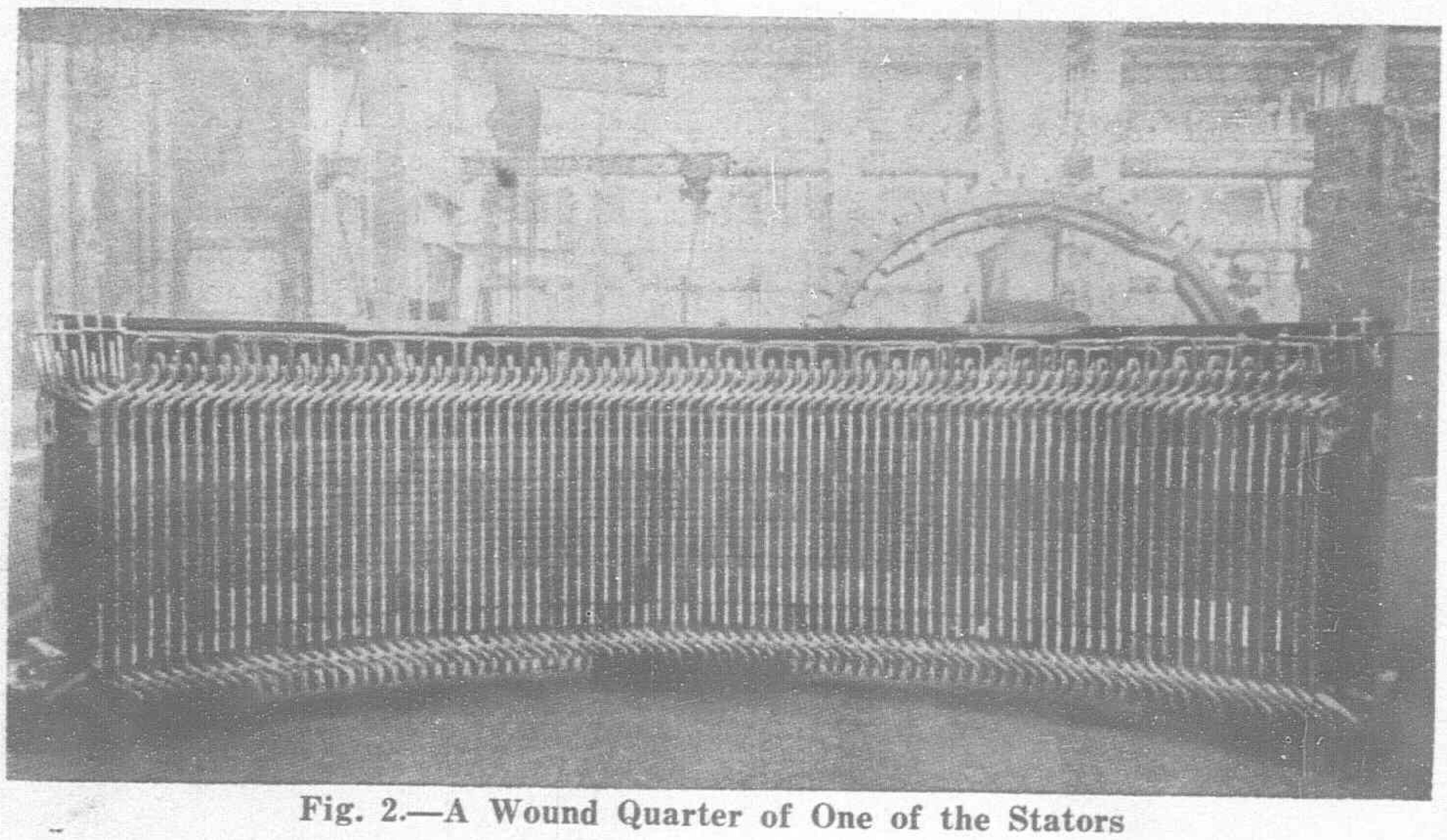


Fig. 2.—A Wound Quarter of One of the Stators

The necessary water power has been obtained, together with ample storage, by damming the Perak River. The relatively low head of from 53 to 60 ft. has led to the adoption of the slow speed of 93.75 r.p.m., with the result that the alternators are the largest built by this Company so far as physical dimensions are concerned. A further factor in determining the size has been the requirement of the consulting engineers, that the flywheel effect shall be 12,500,000 lbs.-ft^2 in order to obtain suitable speed regulation of the set on the removal of load. In addition, the alternators have to be suitable for an overspeed of 100 per cent.

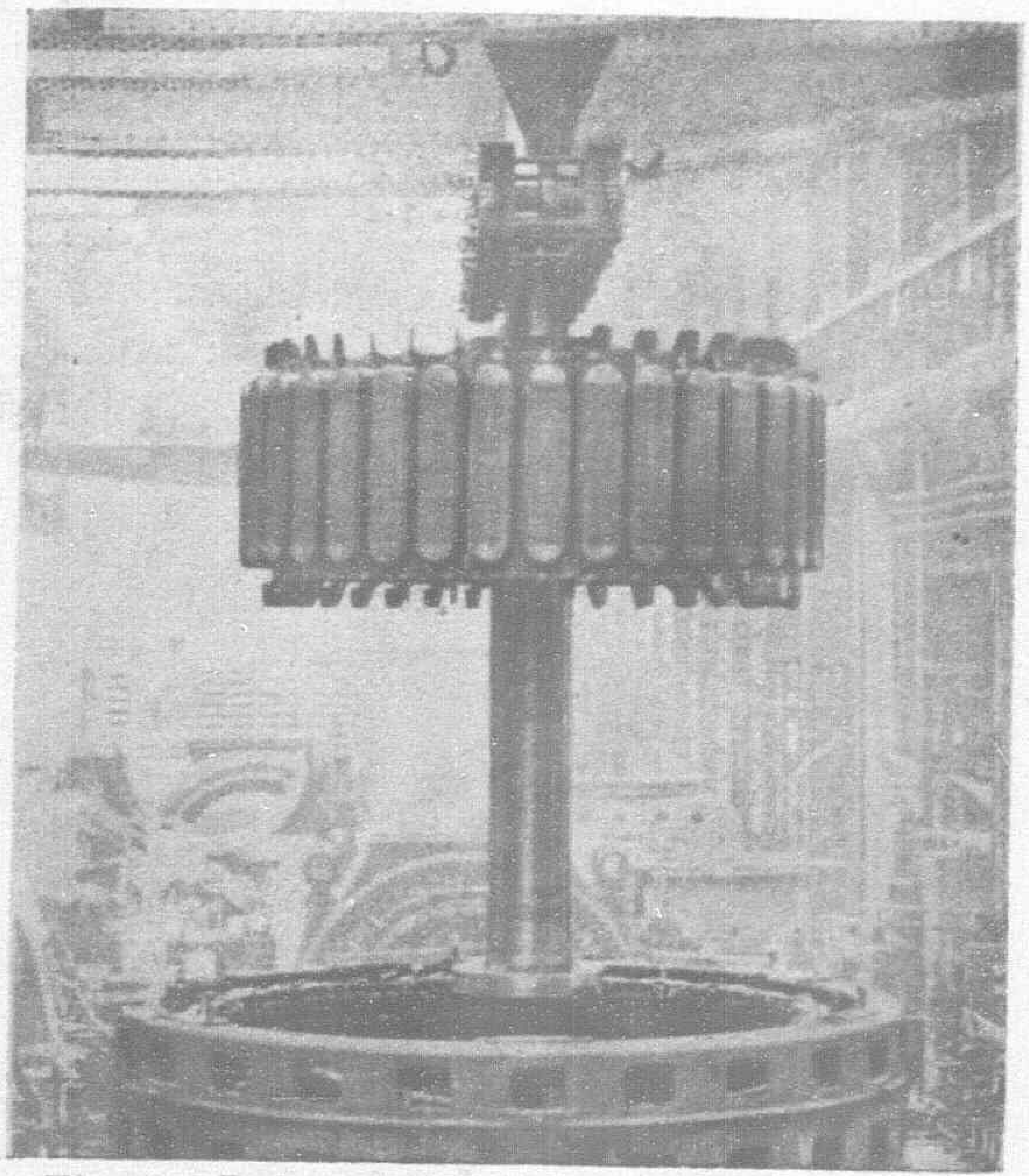


Fig. 3.—Rotor of the 10,000 kVA. Alternator Shown in Fig. 5

The flywheel effect required, called for a rotor of the large diameter of approximately 21 ft., and to enable this to withstand the high over-speed a special construction was adopted. The rotor hub is of cast steel, split into two portions for convenience in shipment, and secured by bolts and shrink rings. The hub carries a number of parallel-sided keys to transmit the torque to the rim. The latter is built up of stampings of high grade sheet steel, assembled with quarter lap and secured between boiler plate end plates by steel bolts. The result is a rim in which the whole of the material is known to be sound, and with three-quarters of the section available for resisting bursting stresses. In addition the rim is free to expand independently of the arms, thus relieving the latter of any tensile stresses other than those induced by their own centrifugal force. The poles are built up of laminations stamped with a pole shoe to support the coils and give proper distribution of the magnetic flux, and with a dovetail projection which engages with the slots formed in the rim. The poles are held in the slots by side keys, this method of construction avoiding the use of heavy pole pressing tackle. The laminations are riveted between massive endplates on which brackets are provided to carry the ends of the rotor coils.

The rotor coils are of copper strip wound on edge and insulated with mica both between turns and from the supporting spool. This form of winding gives the best possible construction from the cooling and the mechanical view points. Owing to the large number of poles and their comparatively short length, the copper is amply stiff enough to resist any tendency to distortion, and supports between the coils are not required.

The vertical shaft is a steel forging with a forged half-coupling at the lower end for connection to the turbine shaft. A hole was bored through the length of the shaft and the interior critically examined for possible flaws.

The large size of the stator, the outside diameter of which is 25 ft. 6-in., necessitated its being built in quarters for convenience in shipment, each quarter being completed (except for the coils spanning the joints) at Works. Fig. 2 illustrates a wound quarter of one of the stators. Each quarter is a rigid iron casting, in which are assembled the core plates of high-grade silicon steel. A special construction provides for the expansion of the core independently of the frame thereby eliminating any possibility of the laminations buckling when hot. Each core is tested before winding by completely erecting it and winding it loosely with several turns of cable through which a single-phase current is passed. Fig. 1 shows a test of this kind in progress. In this way the core and frame are heated by induced currents to approximately full-load temperature, and the core is finally tightened in this condition. The input to the coil is measured, and this figure, after suitable corrections, together with the absence of hot spots, demonstrates that the core complies with the designed conditions.

Suitable ventilating ducts are formed in the core by means of spacers welded to the outside plates of the various packets into which it is divided.

The stator winding is assembled in open slots and is of the two-layer basket type, each coil being completely wound and insulated before being placed in the slots. The conductors are laminated to reduce eddy currents to an inappreciable value.

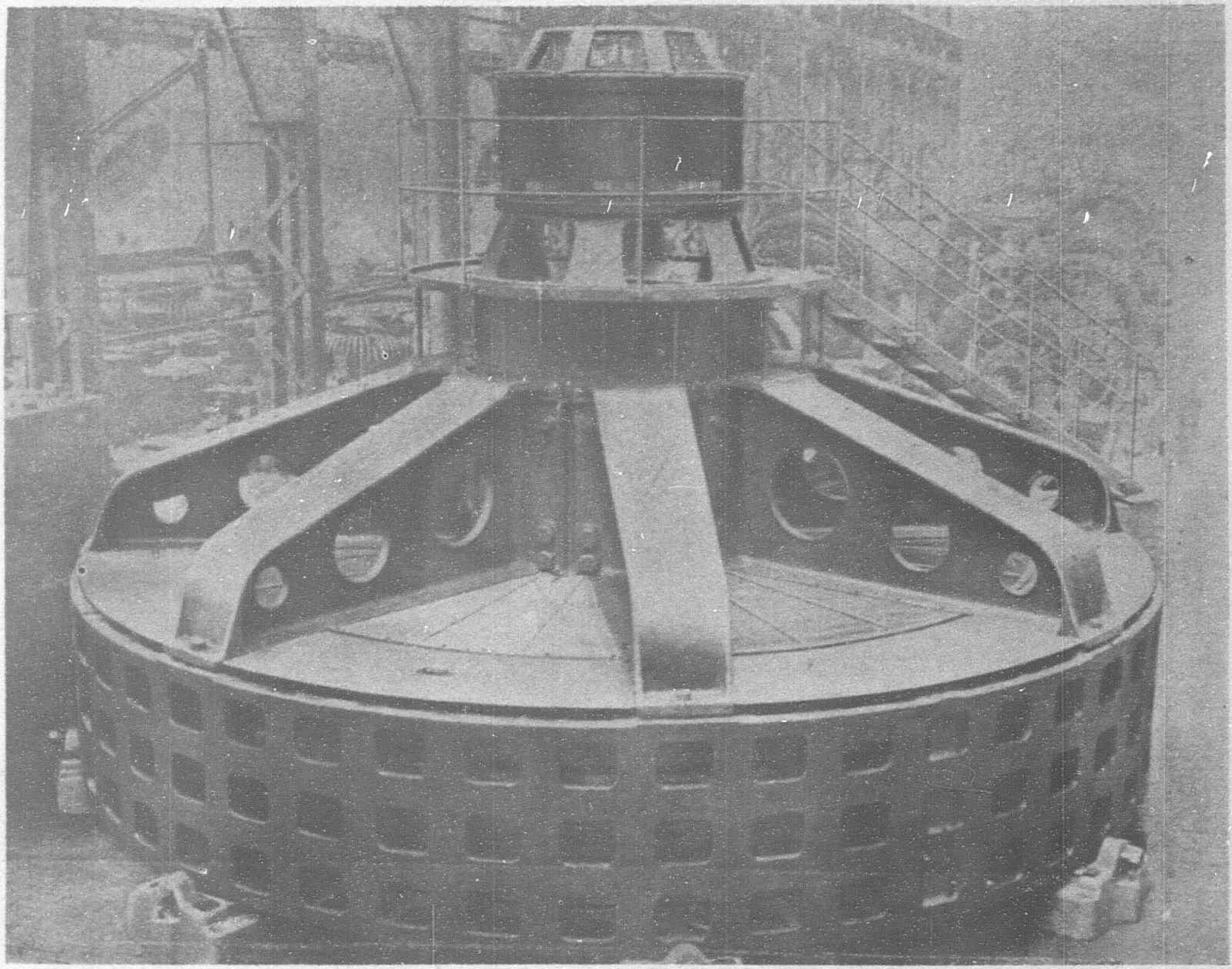


Fig. 4.—One of the Alternators for Perak River Partially Erected in Stafford Works

The whole of the insulation is of mica. The main slot insulation is micafolium, wrapped by hand and pressed to size in a steam-heated press. Experience has shown that this method of insulating ensures a compact cell, completely free from air spaces. The slot insulation is interleaved with the insulation on the overhang portion, which is linen-backed mica tape sealed with a special non-hygroscopic insulating varnish. A leatheroid liner is used to protect the coils where they are held in place by impregnated hardwood wedges driven into dovetails formed in the teeth.

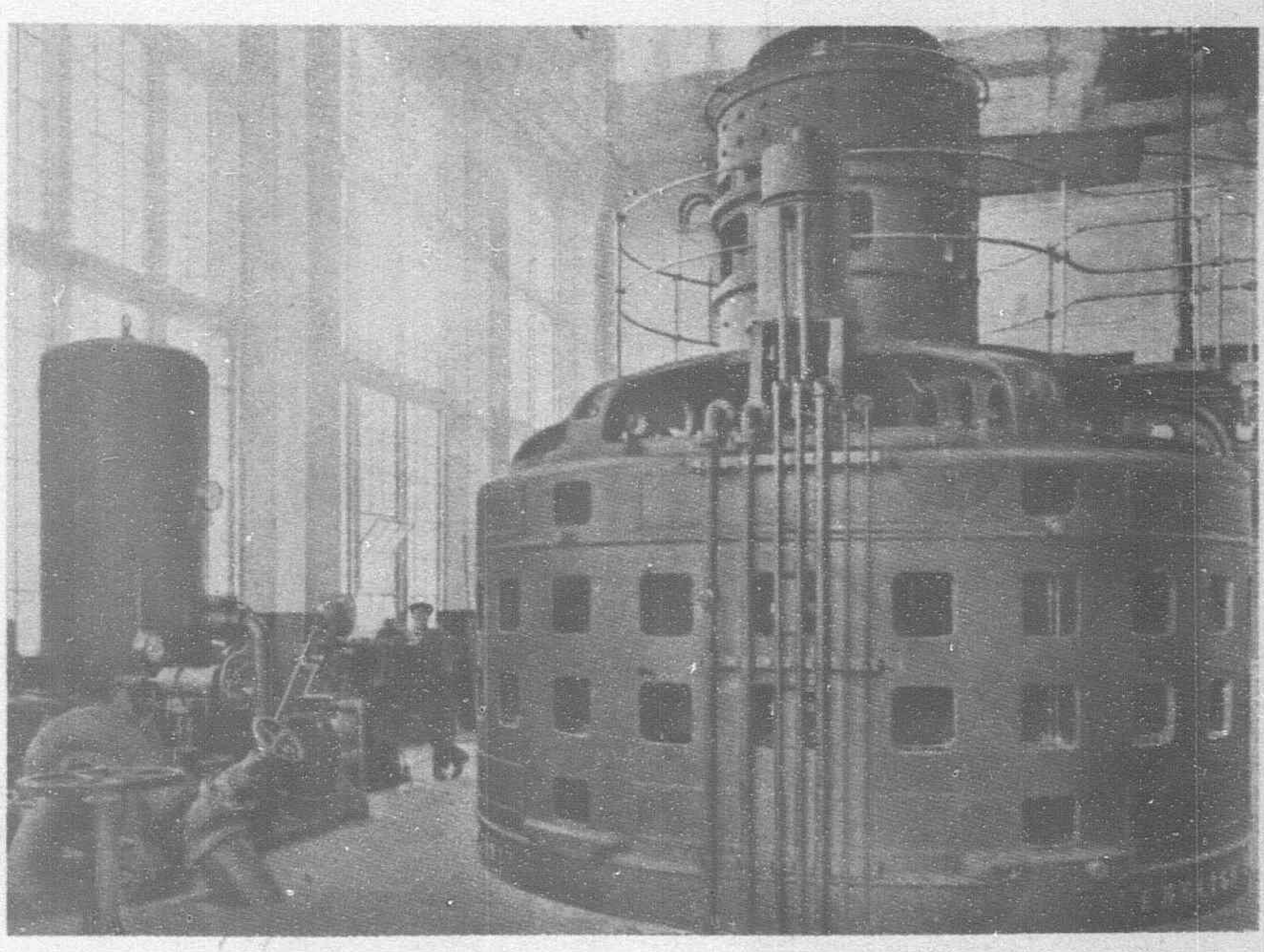


Fig. 5.—The 10,000 kVA. Alternator of the "English Electric," Water Turbine Set at Alouette, Canada

The end windings are lashed to mica insulated support rings bolted to the stator, and wedges are fitted between the coils to brace the winding and render it capable of withstanding a short circuit in perfect safety.

This type of winding enables a fractional number of slots per pole to be used, thereby eliminating higher harmonics from the wave form ; the pole shoes are so shaped as to ensure that the wave form approximates very closely to a sine wave.

Ventilation is effected by air drawn from above by means of fan blades secured to the rotor. The air passes through a duct formed in the laminated rotor rim and then part of it passes over the overhang, while the remainder escapes through the ducts in the stator and through holes cored in the frame to the exhaust air duct surrounding the latter. This duct is circular in plan, but is eccentric to the frame, thus giving increased area as the volume of air increases towards the discharge duct leading to the outside of the station. The floor is level with the top of the alternator frame, and the duct is covered with chequer plating.

The shaft is supported by two guide bearings, one above and one below the rotor, and also by a Michell type thrust bearing. The thrust bearing and upper guide bearing are carried by the upper bracket, which consists of a central hub to which are bolted eight arms, the outer ends of which rest on facings on the stator frame. These arms are insulated from the stator to eliminate bearing currents, and are secured by insulated holding down bolts and dowels.

The base of the central hub supports the thrust bearing, which consists of a number of segmental pads lined with white metal on the rubbing face and carried on a system of pivoted levers to take up any possible small errors in alignment. The load is transmitted from the shaft to the pads by a thrust bell, lightly pressed into the former and secured by a recessed split steel ring. The bearing is completely self-lubricating, as it runs in an oil bath and sets up an adequate circulation of the oil. Cooling water is circulated through a copper coil in the bearing housing. This thrust bearing carries, in addition to the weight of the rotor, the load of 120 tons imposed by the weight of the turbine runner and the hydraulic thrust.

The two guide bearings are babbit lined and an adequate supply of oil is obtained from an oil pump driven by spur gearing from the shaft below the lower guide bearing. In addition, a standby-motor-driven oil pump is being installed capable of supplying oil to any of the three alternators.

The lower bracket is cast in halves for transport purposes and rests on separate sole plates. It carries, in addition to the lower

(Continued on page 512).

The Ceylon Government Railway

THE Ceylon Government Railway is one of the largest departments of Ceylon Administration according to *Commerce Reports*. To assist in its management an unofficial Railway Advisory Board is appointed by the Government.

The railway originally consisted of a line less than 100 miles in length extending between Colombo and Kandy. Construction of this line was begun on August 3, 1858, by the Ceylon Railway Co., which had been formed in England 10 years earlier and later reorganized for this purpose. The contract of the company provided for the deposit, in the Bank of England, of £40,000 as first installment of capital, bearing guaranteed interest at 6 per cent., the Ceylon Government reserving the right of acquiring shares in the company to the extent of £50,000, with power to nominate a director to the board, in addition to the *ex officio* director nominated by the Secretary of State of England.

The original estimate of the company for the construction of the line was placed at £856,554. At the end of 1861, as the railway had not been completed and the expenditure had far exceeded that amount, the Ceylon Government decided to dissolve the contract. The capital subscribed (£297,500) was paid off, and the Government took over the liabilities and assets.

Under a contract awarded January 9, 1863, for the sum of £873,040, the line was completed and opened to traffic on April 25, 1867. The railway afforded an outlet for the coffee industry of the interior of the island, bringing that section within a few hours journey of Colombo.

In response to the demand for further extensions, contracts have since then been awarded for various branches until at the present time the railway is 1,125 miles in length and comprises 704 miles of main lines, 278 miles of branches, and 143 miles of sidings. There are five main lines radiating from Colombo, one of 256 miles extending to Kankesanturai, one of 99 miles to Matara, one of 83 miles to Puttalam, one of 181 miles to Badulla, and one of 85 miles to Opanake. The branch lines are six in number, one of 19 miles from Nanu-Oya to Ragalla, one of 22 miles from Peradeniya Junction to Kandy and Matale, one of 64 miles from Madawachchi to Talaimannar, one of 98 miles from Maho to Trincomalee, one of 65 miles from Gal-Oya to Batticaloa, and one of 10 miles from Avisawella to Yatiyantota.

A route from Matara, at the extreme southern end of the island, to Hambantota is proposed. The linking up of the section from Polonnaruwa to Batticaloa is indicative of the prosperity of Ceylon, as this connects large paddy-growing districts of the eastern province, which previously were accessible to the other parts of the island only by steamer and road transport. Another recent improvement was the completion of the line from Chilaw on the western side of the island to Pullalam, traversing the low-lying district devoted to the coconut industry.

Revenues from the operation of the railway during 1927 (the latest year for which figures are available) amounted to $10,856,228, and from the rail-motor cars, $32,672; or, a total revenue from railway operations of $10,888,900. In addition, a revenue of $1,511 was received from the road bus service.

The cost of operating the railway during the same period amounted to $7,148,540 for the railway proper and $22,522 for the rail-motor cars, or a total of $7,171,062. Other expenses incurred by the railway during 1927 consisted of $11,145 for the cost of road-bus service and $238,698 for pensions and gratuities.

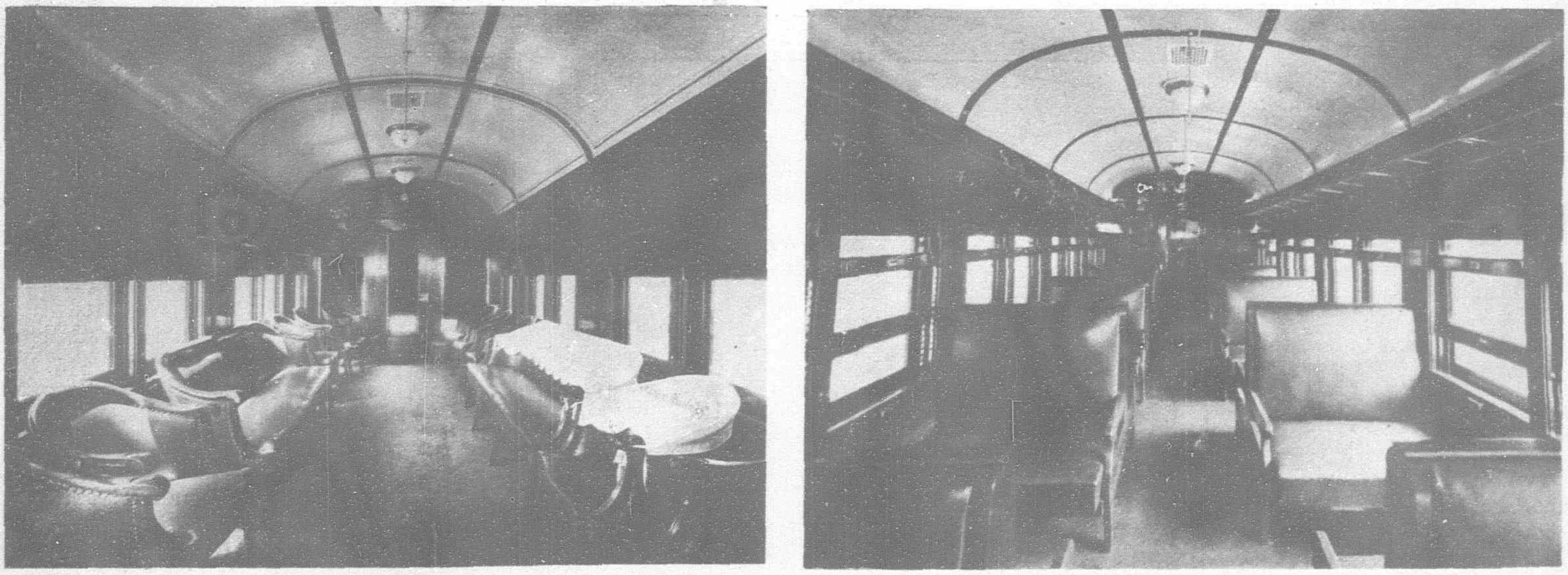
The total freight tonnage in 1927 amounted to 1,621,636. The freight-ton mileage was 1,621,636, and freight-train miles aggregated 1,505,469.

During the same period the passenger traffic comprised 208,223 season-ticket holders and 16,948,655 others.

Rolling stock of the railway at the end of 1927 consisted of 234 locomotives, 2,548 freight cars, and 1,249 passenger cars.

Locomotives and Passenger Cars for the Kirin-Hailung Railway

(Continued from page 503)



First Class Saloon

Second Class Section

Interior Views of the Cars

from abroad, this feature has, and ever should, commend itself as a most excellent method of design, and a thoroughly sound business proposition.

Passenger Cars

The equipment of Passenger Cars furnished by the American Car & Foundry Company consists of :—

One 1st Class Passenger and Saloon Car, at one end of which are four Coupes capable of seating 32 passengers, while the other end is provided with a Saloon having a seating capacity for 18 people. The rear, or Saloon end of the car has a rail enclosed Observation Platform. The entire car is luxuriously fitted out with upholstered furniture, and has superior interior decorations as may be seen from the photographs.

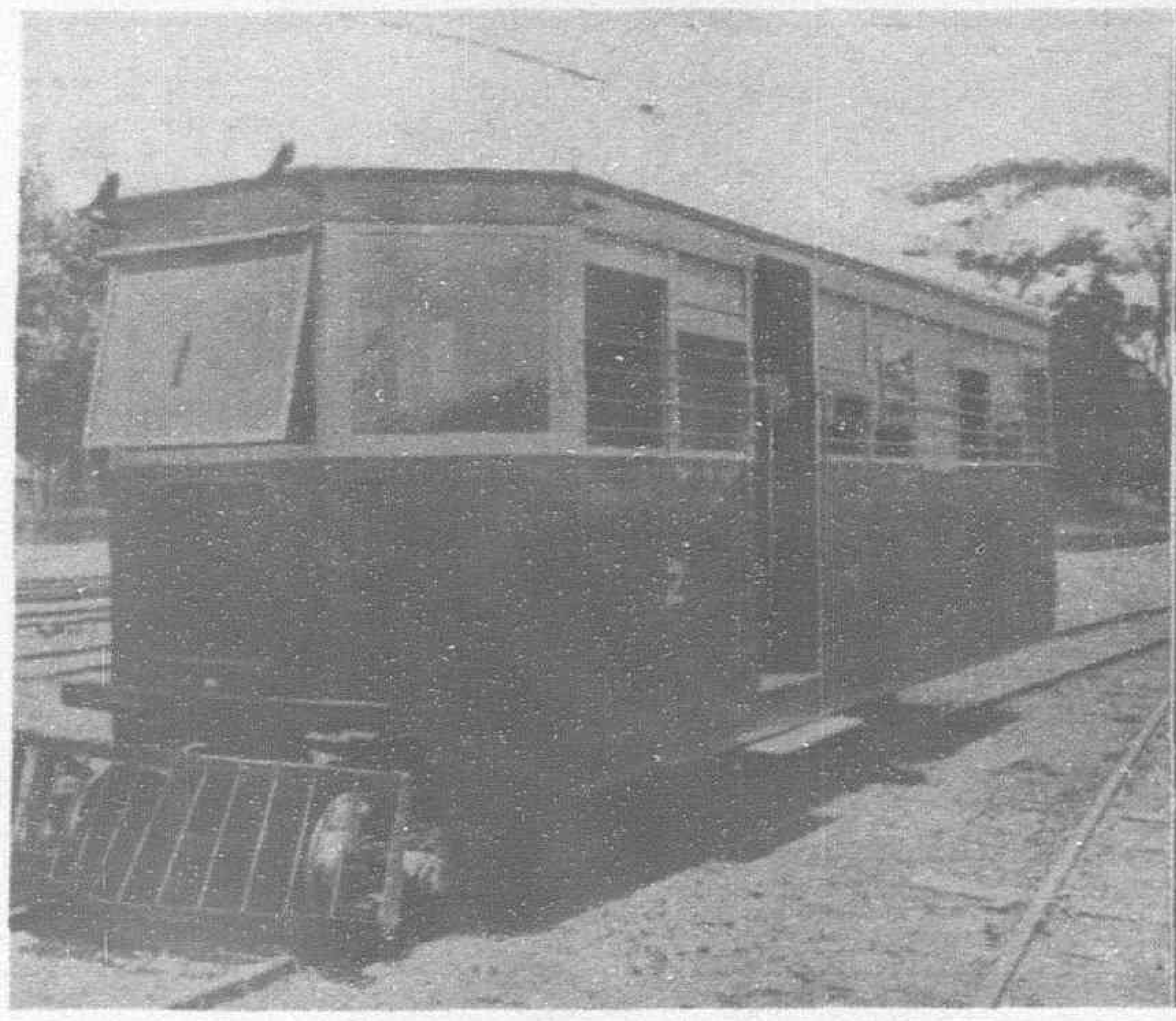
The two combination 1st and 2nd Class Passenger Cars are fitted out in the same superior style,—having very comfortable leather upholstered seats. The seating capacity of the 1st Class section is 22, while the 2nd Class section will accommodate 40 people.

The eight 3rd Class cars, seating 110 people each, have the same first class workmanship as obtains on each of the other classes, and the seating arrangement and interior finish, is well in advance of the usual requirements for this class of service.

All cars are equipped with Westinghouse Air Brakes and Air Signal service, and have the "Gold Direct System" for steam heating the train. Each car is lighted with electricity, which is generated by the "Safety" axle generator system when the car is in motion, and furnished by a system of batteries when standing still. All cars are equipped with the standard M.C.B. automatic couplers and, with the exception of the observation platform of the Saloon car, all have vestibule platforms.

The Manila Railroad Company

THE Manila Railroad Company has had a most profitable year in 1928, the loss sustained in passenger revenue as a result of highway motor competition, having been more than offset by greater receipts from freight traffic, with the result that both gross revenues and net income for 1928 even exceeded those for 1927, which were the largest figures previously recorded by the Company. It would have been a physical impossibility to have handled the greatly increased freight tonnage actually carried during the year, had it not been for the improvements carried out and additions to plant and equipment acquired during recent years and paid for from earnings. This shows how necessary it is for a common carrier like the Manila Railroad Company, located in developing territory, to have adequate surplus earnings that can be invested in improved facilities in order to cope with the augmented demands.



New Motor Rail Car on Dodge-Koppel Chassis with Body Erected in Caloocan Shops

Motor Rail Car—Interior View

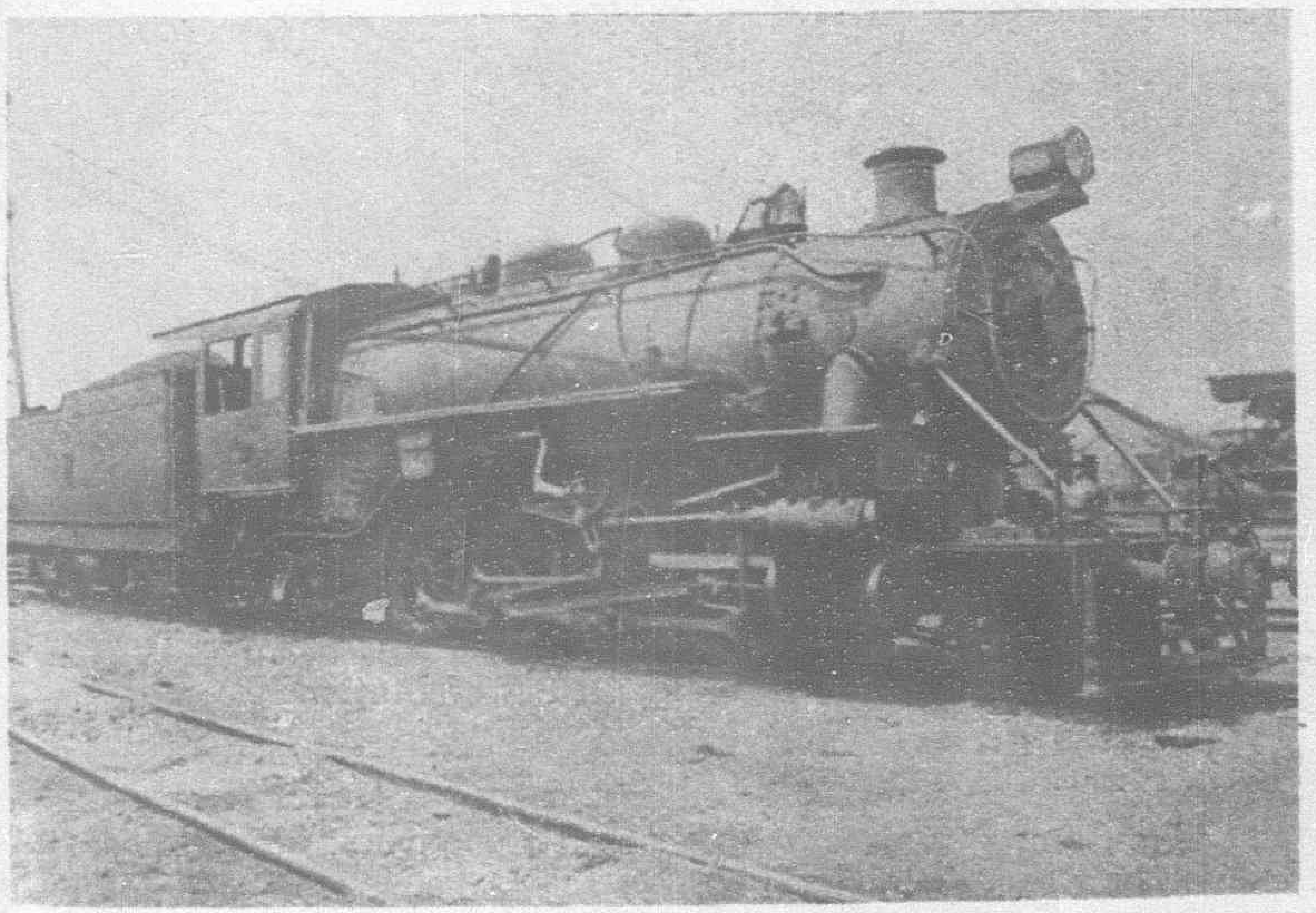
Among the most important items under railway construction were:

The Bauang Sur-San Fernando Extension (Northern Extension).—Work on this extension was continued throughout the year. It starts at Km. 253.750 of the Main Line North just beyond the station of Bauang Sur and extends to Km. 266.010 at San Fernando, the capital of the Province of La Union, with a branch line to the port of San Fernando, 2.15 kilometers in length, comprising in all 14.41 kilometers of main line track and 4,031 lineal meters of sidings. On December 31, 1928, 7.07 kilometers of main line track and 1,161 lineal meters of sidings had been laid. The most important bridge structure built during the year is the steel bridge over the Bauang River, consisting of seven 150-foot through spans and five 20-meter deck spans at each end, its total cost being Pesos 382,000. All necessary structures such as station building, freight shed, light plant, etc., for the new station at Bauang, and entrance roads to give access to the station premises were practically completed at the end of the year, so that the Company was able to open the new station for commercial traffic shortly thereafter, or on January 16, 1929.

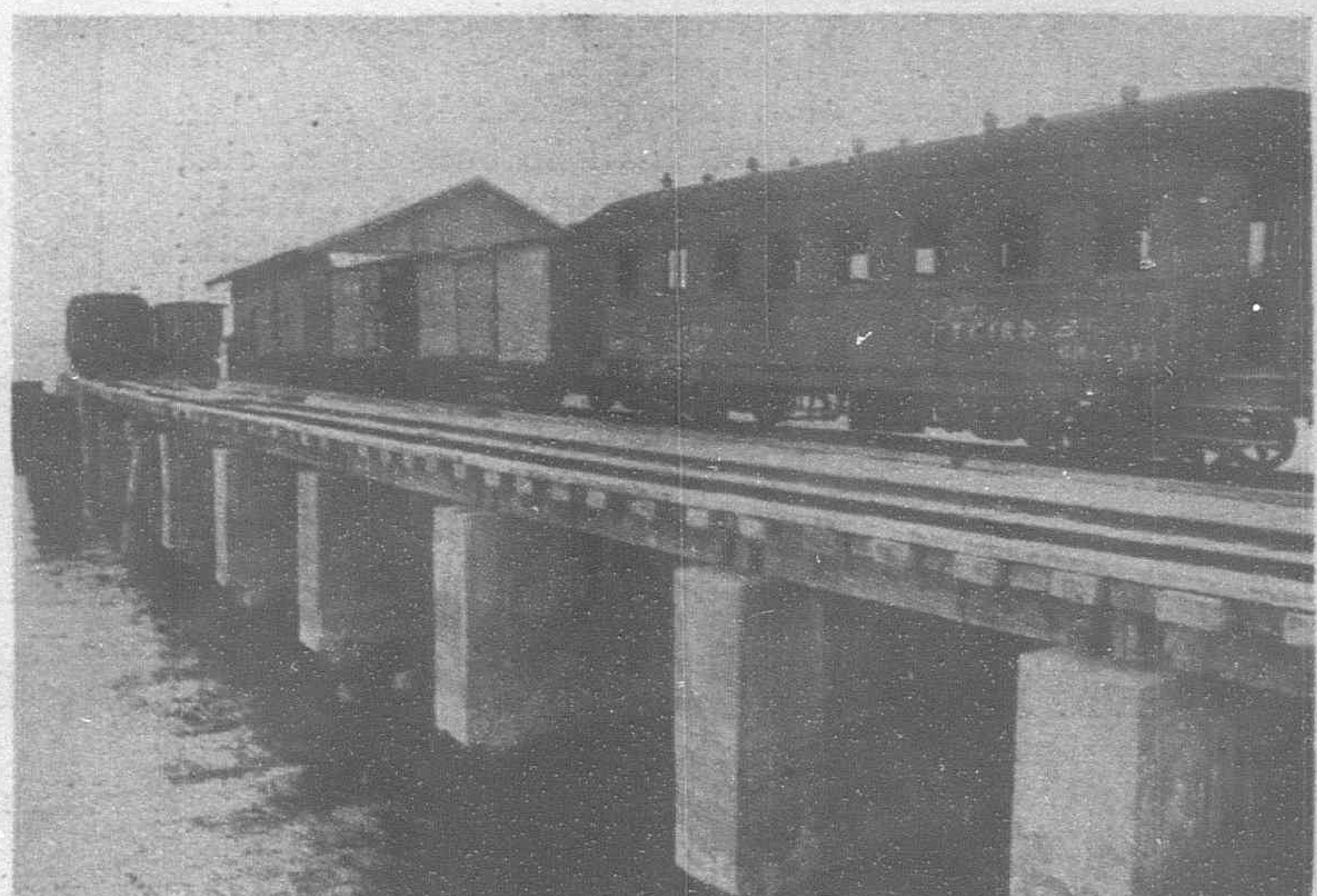
The Pamplona-Ragay Extension (Southern Extension).—Active construction on this project was undertaken during the year 1928, after the completion of the preparatory survey work and assembly of construction materials and equipment referred to in the previous report. Track was laid and ballasted from Pamplona, Km. 369,800, to the Libmanan River, Km. 358.650, a distance of 11.15 kilometers, together with a spur track to Ruñgos wharf, 1,700 meters in length. Grading was finished up to Km. 352, a distance of 6½ kilometers beyond the end of track and grading work was opened up to Km. 342, an additional ten kilometers. Eleven pile bridges were constructed on the main line and one on the Ruñgos spur line. At the end of this spur line, a wooden wharf was constructed on the Bicol River to receive construction materials and equipment shipped by boats from Hondagua as well as heavy freight shipments consigned to Legaspi Division points. The temporary pile bridge over the Libmanan River was practically completed at the end of the year, and on February 3, 1929, the line between Pamplona and Libmanan was opened for commercial operation.

Strengthening Bridges, Main Line North and Cabanatuan Branch.—This work which was started in the latter part of 1927, was continued and all bridges on the Main Line North strengthened for Cooper's E-35 loading at a total cost of approximately Pesos 400,000. Work was also begun late in the year on the strengthening of the bridges on the Cabanatuan Branch, where heavy tonnage of rice and palay is handled necessitating the use of larger type engines than heretofore run on this branch.

Raising Agno River Bridge and Widening River Channel.—During the rainy season of 1927 the washouts occurring on both sides of the Agno River bridge showed conclusively that its waterway was quite insufficient and that the bridge had not been placed high enough to allow drifts to pass under the bridge. In order to remedy this situation, an expenditure of Pesos 200,000 was authorized for raising the Agno River bridge and for widening the river channel.



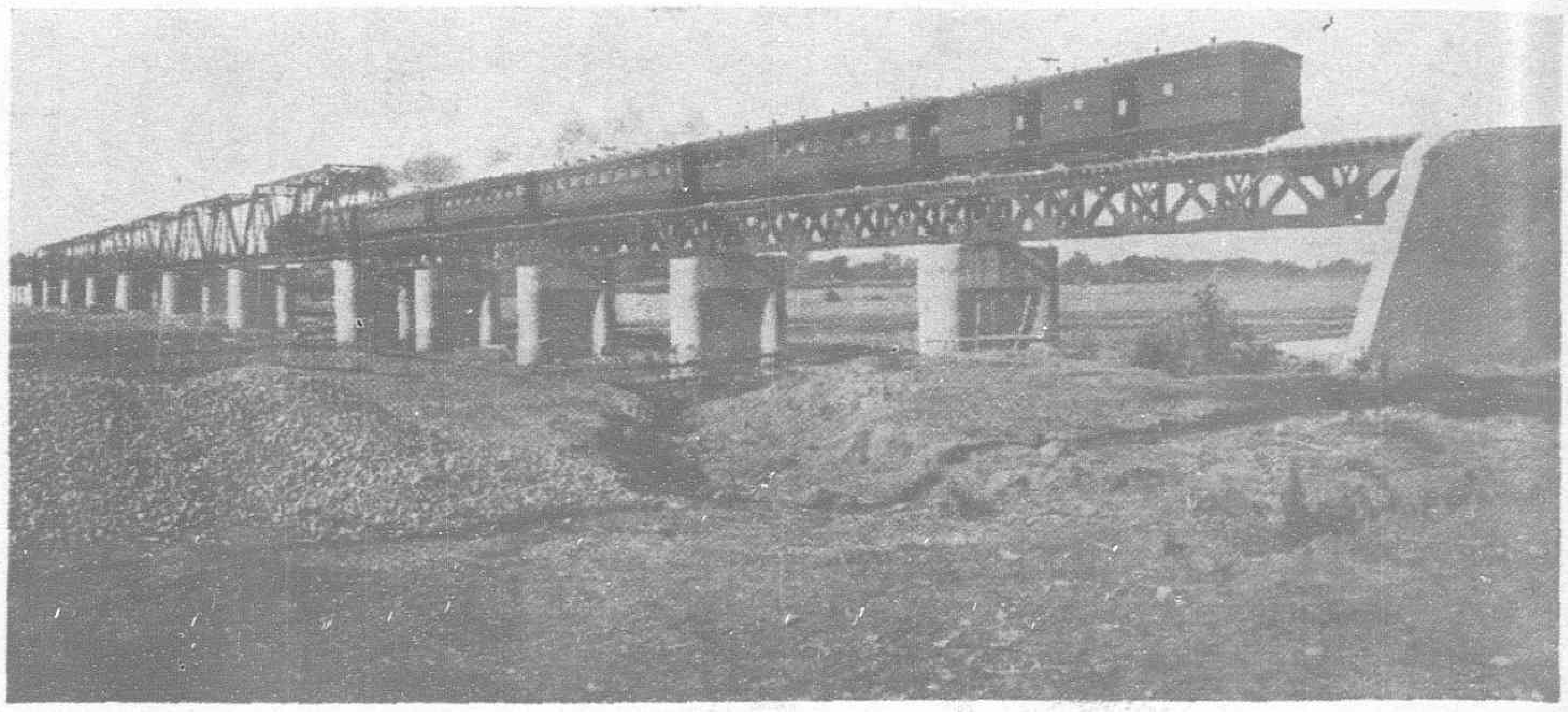
Three-Cylinder "Mikado" (2-8-2) Locomotive. Tractive Power, 26,350 Pounds. Built by the Baldwin Locomotive Works



Part of New Permanent Portion of Hondagua Wharf

The existing structure consisted of twelve 20-meter bridge spans. These spans were raised one meter in height and five new 20-meter spans were added at the south end, making the total length of the bridge 340 meters.

At the same time, about 67,048 square meters of land on the Bautista side of the river were purchased. The acquisition of this land was necessary in order to widen the river channel so that there could be an unimpeded flow of water under the bridge. This was accomplished by excavation work in this area, the material removed being used for raising the railroad embankment on both sides of the bridge and for the extension of the dyke from the north switch at Bautista to the south end of the bridge.



Completed Steel and Concrete Bridge Over Bauang River, Main Line North, Bridge Consists of Seven 150-ft., Through Spans and Five 20-Meter Deck Spans at Each End

Construction of Permanent Bridges

During 1928 twelve steel bridges with spans having a total length of 220.8 meters (217.4 meters in 1927) were erected at the following places replacing wooden pile trestles :

Km. 115-116,	Main Line South...	... One	100-ft. through span
,, 203-204,	,, ,, ,, ...	... ,,	45 ,, ,, ,,
,, 204-205,	,, ,, ,, ...	... ,,	60 ,, ,, ,,
,, 205-206,	,, ,, ,, ...	... ,,	45 ,, ,, ,,
,, 208-209,	,, ,, ,, ...	... ,,	45 ,, ,, ,,
,, 209-210,	,, ,, ,, ...	... ,,	20-meter ,, ,,
,, 213-214,	,, ,, ,, ...	... ,,	60-ft. ,, ,,
,, 215-216,	,, ,, ,, ...	... ,,	100 ,, ,, ,,
,, 216-217,	,, ,, ,, ...	... ,,	20-meter deck span
,, 218-219,	,, ,, ,, ...	... ,,	45-ft. through span
,, 220-221,	,, ,, ,, ...	... ,,	10-meter deck span
,, 223-224,	,, ,, ,, ...	... ,,	60-ft. through span

In addition, six 20-meter through steel spans located south of Calumpit between Kms. 44 and 46 on the Main Line North were replaced by concrete pile bridge with I-beam stringers. These were single span English bridges put in when the line was originally built to take care of the overflow of the Pampanga River, but which could be used after proper strengthening in the shops more advantageously elsewhere.

Equipment (Rolling Stock)

In addition to the new freight cars received and put into service, all of which are equipped with automatic couplers, it has been decided to fit all cars, except small 7-ton cars, that enter the shop for heavy repairs with this type of couplers, the special design which was devised for the Company's rolling stock having proved very satisfactory and serviceable.

During the year eight new 3-cylinder " Mikado " type (2-8-2) locomotives ordered from the Baldwin Locomotive Works, Philadelphia, Pa., were received, erected and placed in operation. These engines are rendering excellent service on freight and passenger trains on both the Northern and Southern Lines, hauling longer and heavier trains with reduced coal consumption as compared with other locomotives of less tractive power. The total cost of these engines placed on rails was Pesos 594,684.49, or Pesos 74,335.56 each.

Large Vertical Alternators for the Perak River Hydro-Electric Power Company

(Continued from page 509).

guide bearing, eight cylinders for braking and jacking. Four cylinders are supplied with compressed air for braking, and the other four with oil from a high-pressure hand-operated oil pump for jacking up the rotor for examination of the thrust bearing, etc. When in operation the rams bearing the braking shoes are forced against a track formed on the rotor hub, and the set is brought rapidly to rest. An interlock is provided to prevent the brakes being applied when the turbine gates are open.

Each alternator is fitted with a direct-coupled exciter at the upper end of the shaft, the exciter frame being carried from the thrust bearing casing.

The special form of rotor construction described above requires that the rotors shall be built up at site, but trial fits of portions of the core were made at Works. For this reason all tests except material tests, stator core tests and high-voltage tests, are being postponed until the sets have been finally erected in the Power House.

The first machine has been completed and the parts of the rotor shipped to site, where assembly will be commenced shortly. The second machine is completed and partially packed, while the third machine is in course of manufacture.

It is interesting to record that an order for two 16,666 kVA. 125 r.p.m. alternators of a similar type to those described above has recently been received from the Public Works Department of New Zealand. These machines are even larger than those described above.

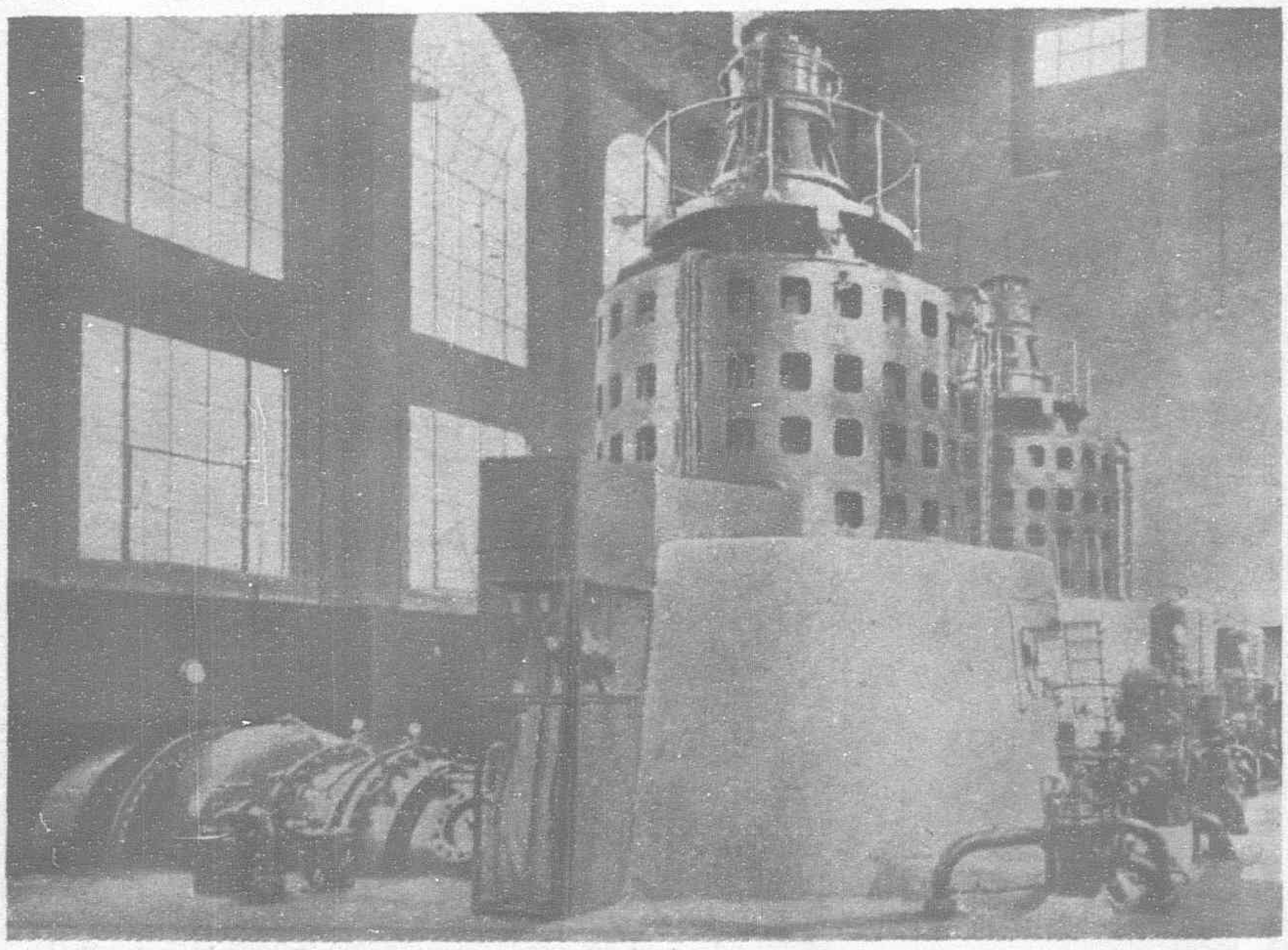


Fig. 6.—Two 6,000 kVA., 375 r.p.m., "English Electric" Water Turbines and Alternators in Bonnington Power Station

Figs. 3 and 5 show the 10,000 kVA. 200 r.p.m. alternator of a complete " English Electric " Water Turbine Plant in the Alouette Power Station of the British Columbia Electric Railway Company at Vancouver. This station is specially interesting as being the largest completely automatic power station in the world.

The Company also manufactured the turbines and alternators shown in Fig. 6 which illustrates the interior of the Bonnington Power Station of the Lanarkshire Hydro-electric Power Company. Two similar " English Electric " units are in operation in the Stonebyres Station of the same Company.

Coal Mining in Manchuria

The most important undertaking of the Company, next to the railways, is coal mining, carried on at Fushun and Yentai. The investment in this industry amounted to Y.102,700,000 at the close of the fiscal year ending March 31, 1928. During this fiscal year the product of the mines, amounting to 7,429,624 tons was sold; the gross receipts were Y.82,787,419 and the expenses Y.73,039,119, leaving Y.9,748,300 as net profit. The annual output amounts to 6,982,870 tons, more than 26,000 tons a day. In the year 1907, when the Company took over this undertaking, the daily output was only 300 tons.

The Company is fortunate in operating a rich coal-bed like that at Fushun, the largest open cut in the world. Fushun lies in the valley of the Hun river, a little over twenty miles east of Mukden. It runs east and west about 10 miles parallel with the river and from north to south 2½ miles, covering 23 square miles. The seam is interbedded in the tertiary stratum with a northerly dip of about 30 degrees and with an average thickness of 130 feet, the thickest part being 430 feet. The general thickness of coal seams in Germany, Great Britain, and the United States is said to be from two to forty feet. Whatever the facts, the deposit in Fushun is exceedingly large, being estimated at from 952,000,000 to 1,200,000,000 tons. Probably no similar reserve can be found anywhere in the world in such a relatively small area.

The district has a long history. Coal was first worked by Koreans some 600 years ago, and was used for the baking of earthenware. Three hundred years later, further digging was prohibited for the curious reason that it was near the mausoleum of a Manchu Emperor, built in the suburbs of Mukden. Prior to and during the Russo-Japanese war, the mines were operated by Russians on a small scale for their own needs, the daily output amounting to 300 tons. After the war, the Japanese military authorities carried on the mining until it was turned over in 1907 to the South Manchuria Railway Company, together with the Yentai and other minor fields. Then it entered a new era of large-scale production on a scientific basis, equipped with modern machinery, mostly imported from the United States and Germany.

As a first step in the most advanced scientific and technical operation, Dr. Buichiro Matsuda, chief engineer of the Mitsubishi Mining Co., was invited by the Company to occupy the post of Superintendent-General of the Mine in January, 1907. Dr. Matsuda lost no time in applying what was known as the first stage of the program of developing the mine. By this the Company improved three old pits and opened two new pits on a large scale; one of which was named the "Oyama Pit" and the other the "Togo Pit." This program was completed in 1912 at the cost of Y.9,200,000, and the daily output was increased from 360 to 5,000 tons.

Pressed by the increasing demand, however, the Company, as the second stage in developing the Fushun mine, introduced the open-cut mining method at two places, besides opening three new pits. The new sand-flushing method was adopted, with an electrified sand-carrying railway, supplied with current from a Mond Gas power plant. As the result of this improvement, the average capacity of production increased to about 7,000 tons, or three million tons annually, in 1918. But the demand for coal continued to increase, due to industrial expansion in Manchuria and Korea, and also to the greater use of coal by the natives in place of their former fuel, kaoliang stalks, which necessitated the import of coal into Manchuria to the extent of 150,000 tons in 1908, and 490,000 tons in 1909. To meet the ever-increasing demand from growing industries, particularly that of the Anshan Iron Works, the Company planned another expansion. This resulted in a so-called "Ten Year Program" drawn up in 1919 and modified in 1924 as the third stage of mining development, by which the excavation of a large shaft at Lunfeng, the open cut of the remaining seams extending from Kuchengtze to the Yangpaipu brook, and the extension of the open cut of Chien-chinchai so as to connect with that of Kuchengtze, were to be worked. With the completion of this scheme, the annual output from Fushun Mines, excluding Yentai Mines, is expected to be over 8,000,000 tons in the fiscal year 1933.

The following table in English tons shows the quantity of coal produced and sold:—

Years	Quantity of coal transferred from previous year	Quantity of production	Quantity purchased	Total	Quantity sold
1907-8......	18,712	233,325	—	233,325	202,320
1912-3......	367,541	1,513,254	86,046	1,599,315	1,639,955
1917-8......	134,192	2,389,584	358,492	2,748,076	2,712,301
1922-3......	682,938	3,921,727	346,470	4,268,197	4,536,004
1927-8......	466,672	6,982,870	573,858	7,556,728	7,429,624

The table below shows the growth of the mining industry at intervals of five years since 1907:—

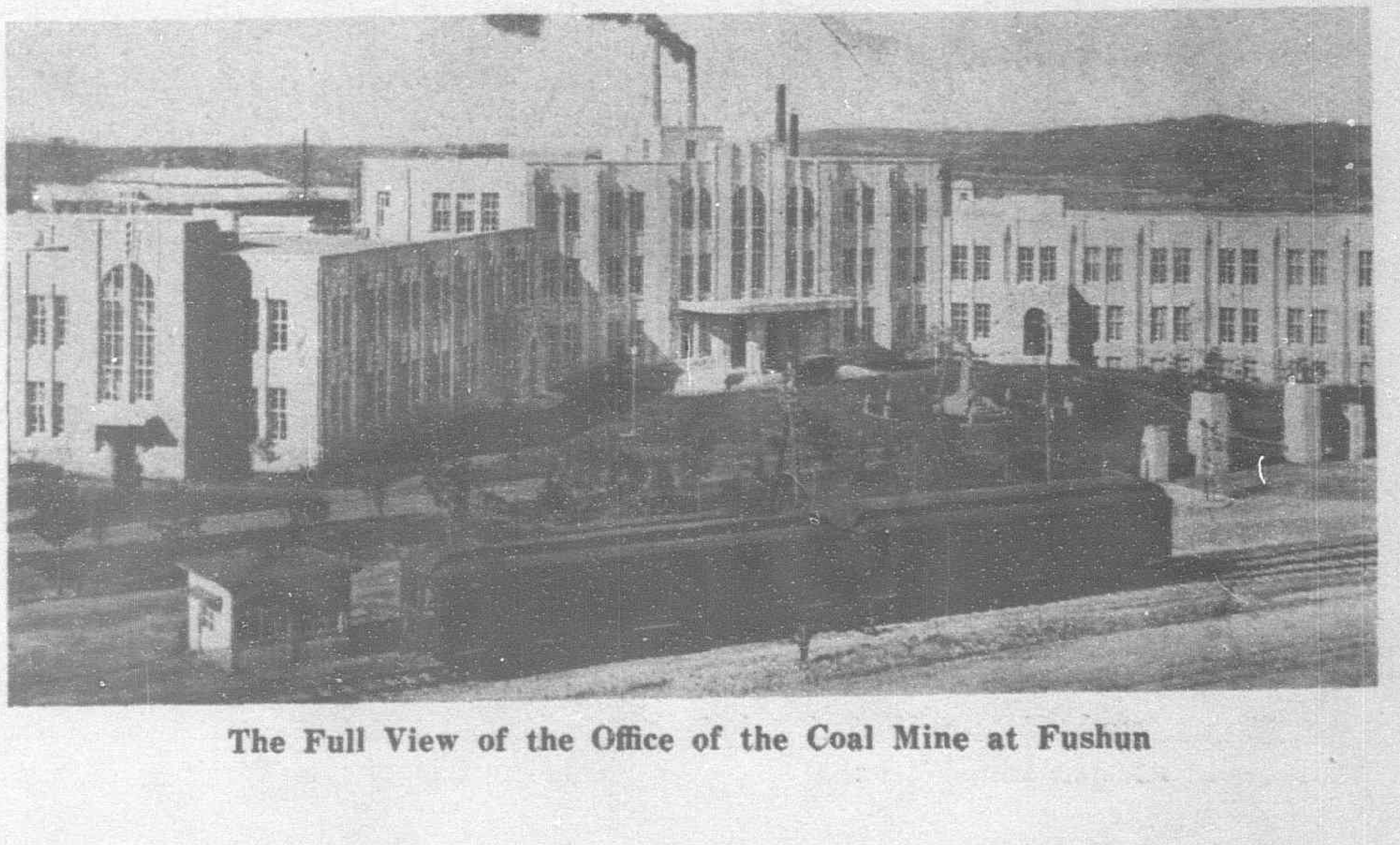
	Receipts					
Years	Sale of coal Yen	Sale of other minerals Yen	Other Yen	Total Yen	Expenditure Yen	Profit Yen
1907-8	1,318,676	—	215	1,318,891	765,886	533,005
1912-3	9,156,631	—	37,122	9,193,753	7,347,091	1,846,622
1917-8	20,030,480	294,042	43,941	20,368,463	15,047,917	5,320,546
1922-3	51,665,247	202,724	1,271,952	53,139,923	46,424,196	6,715,727
1927-8	80,509,052	273,113	2,005,257	82,787,419	73,039,119	9,748,300

It is of interest to note the disposal of the coal sold in the fiscal year 1927. Of 7,429,000 tons sold, Manchuria consumed 3,326,000 tons, of which 1,323,000 tons were for account of the S.M.R. itself, 65,000 tons used by employees, and 1,937,000 tons by other consumers. Exports amounted 3,401,000 tons, of which Japan proper purchased 1,695,000 tons, Korea 417,000 tons, Taiwan 4,000 tons, North China 180,000 tons, South China 922,000 tons, while 183,000 tons went to points in the South Seas. More than 703,000 tons were furnished to steamers for bunker coal.

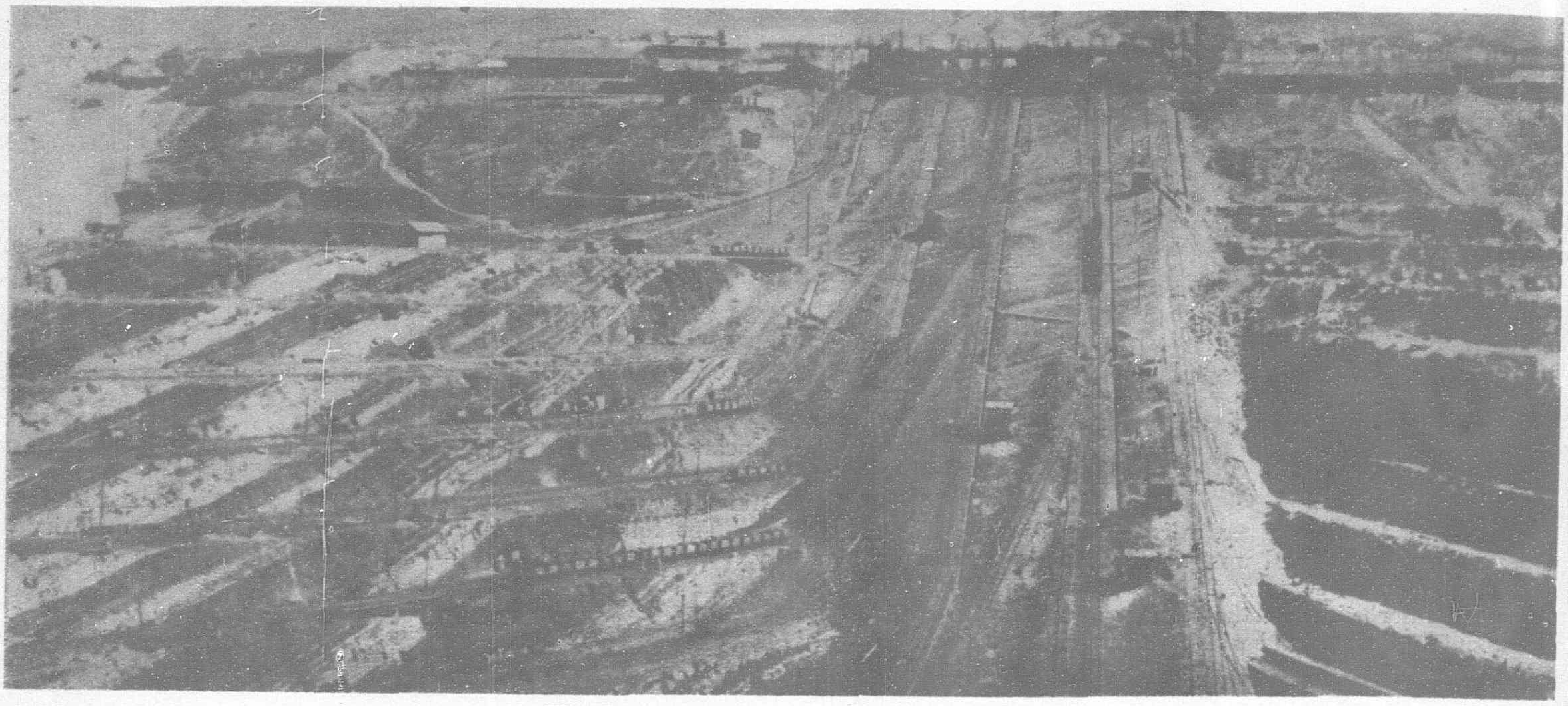
Shale Oil Plant

At Fushun Mine, there are also huge reserves of oil shale right above the coal bed. The Fushun oil shale running east and west for ten miles and north and south for one mile, being 450 feet deep in the thickest part, is estimated at as much as 5,300,000,000 tons. This shale contains an average of six per cent. of oil, the upper part of the seam containing 10-12 per cent. and gradually being reduced to 1 or 3 per cent. at the lower level, besides 0.55 per cent. of nitrogen.

The combustible capacity of the oil shale taken from the Oyama shaft, being incidentally discovered in 1911, the shale was sent to the Central Laboratory, Dairen, for test, in the following year. But in those days the utilization of oil shale,



The Full View of the Office of the Coal Mine at Fushun

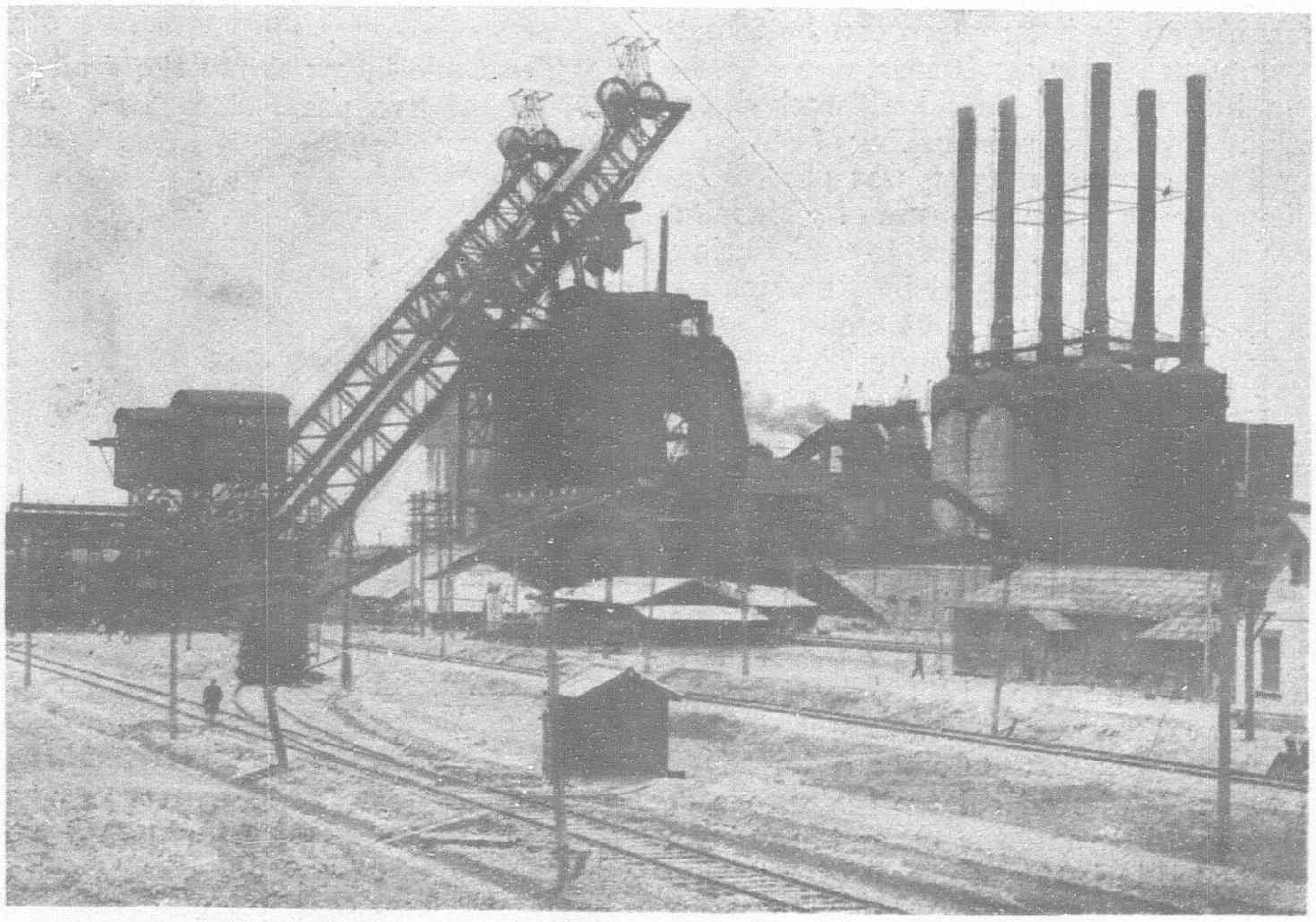


The Famous Open Cut at Fushun Colliery

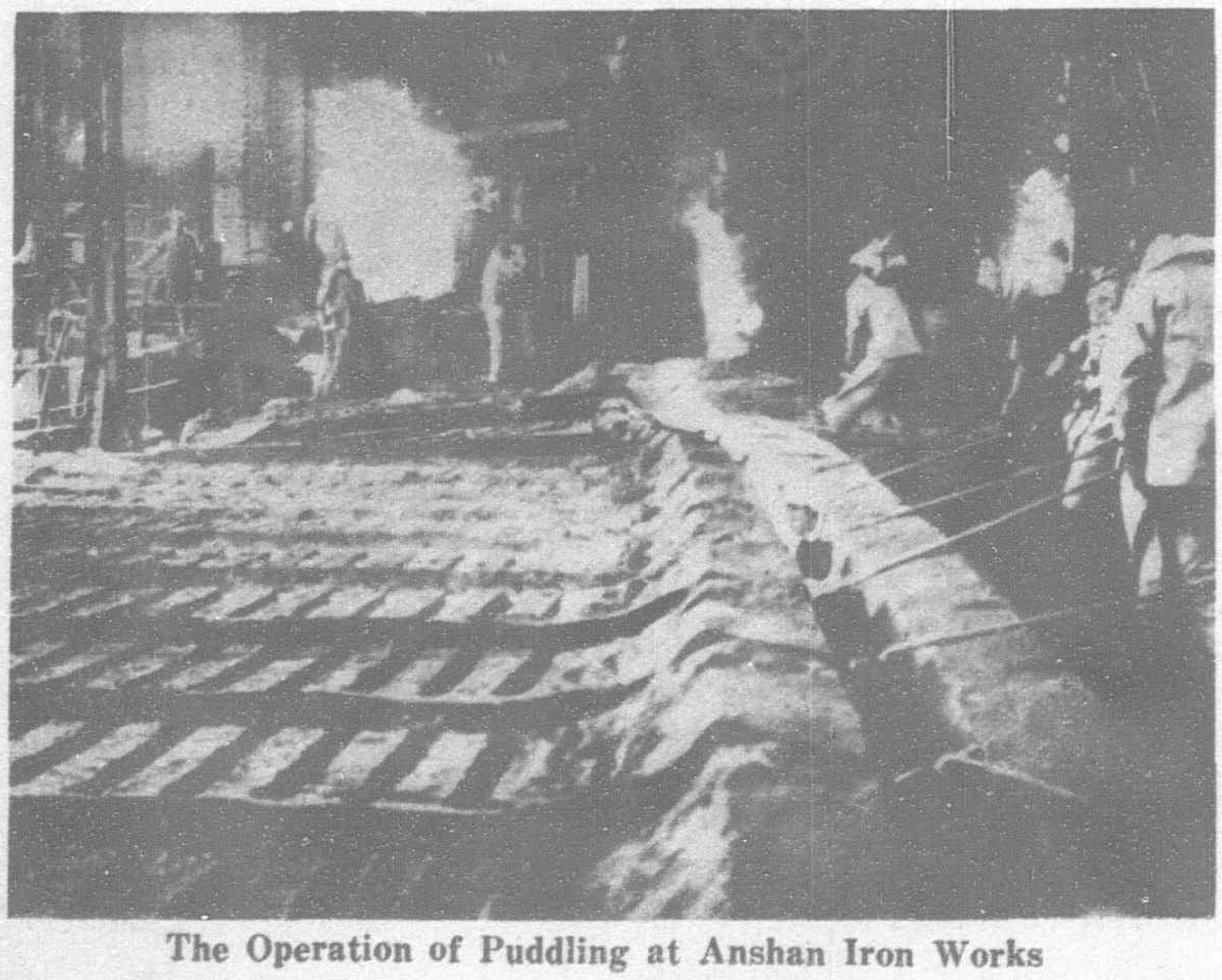
however, was regarded as commercially impossible even in Germany and elsewhere, Scotland only excepted. But the wonderful development of the airplane and automobile, and the extensive application of the Diesel engine to ships and to the industries utilizing oil during and after the European war, revolutionized the fuel question, and petroleum has become one of the fundamental bases of the industrial and military life of a nation. The consumption of this product in Japan is steadily increasing.

The annual consumption was about 350,000 tons in 1919; it was increased to 1,000,000 tons in 1928, of which more than two-thirds were imported. Thus Japan herself is confronted with this important oil question.

Meanwhile, the South Manchuria Railway Company was most seriously studying its industrial workability by utilizing oil shale at Fushun. In order to ascertain whether the shale is really suited for industrial operation, several hundred tons of Fushun shale were sent in 1920-2 to the Fuel Research Station of the Japanese Navy, to Sweden, and to Scotland for test. Subsequently, several experts in the Company's



A View of the Anshan Iron Works, Operated by the S.M.R.



The Operation of Puddling at Anshan Iron Works

The Electric Shovel Working at the Open-air Mining, Fushun service were despatched abroad to investigate fully existing enterprises, in addition to the scientific side of the question. In 1925, a so-called semi-industrial plant was set up, and a process for extracting oil by dry distillation was successfully worked out.

Based on this process, the Company finally decided to establish a shale oil plant at Fushun with the capital allotted of Y.8,500,000. This plant is to manufacture about 70,000 tons of the crude oil and by-products, 18,000 tons of ammonium sulphate, and 7,000 tons of paraffin. Oil production is to be gradually increased.

Iron Works

The South Manchuria Railway Company early contemplated working the iron ore found in great quantities at Anshan. The presence of iron deposits here was discovered in 1909 by the officials of the Geological Institute of the Company. By an agreement signed in 1914 with China, a concession to work this iron mine was given to the Chenhsing Kungssu, a Sino-Japanese company. It was also arranged that the ore produced at the mines owned and operated by this concern should be supplied to the South Manchuria Railway Company.

Steam Bucket Excavator, Removing Earth Above Coal Bed, at Fushun Open Cut

The original plan was to erect a plant large enough to produce 1,000,000 tons of pig-iron a year, or 800,000 tons of steel. Two blast furnaces, were to be erected as the first stage of the original plan. Construction of the first furnace was set about in May, 1917, and completed in December, 1918. Pig-iron was first produced in May, 1919. When the construction of the second furnace was about completed at the beginning of 1920, the price of pig-iron fell from Y.440 a ton in war-time to Y.50, owing to the world-wide depression after the war.

With a view to adjusting the enterprise to the new conditions, the second furnace was not put in service, and further construction of the third and fourth furnaces planned as the second stage in the original scheme was stopped. Yet Japan was pressed by the necessity of this product to meet her ever-developing industry, and the South Manchuria Railway Company, therefore, continued to develop this undertaking, although it involved heavy financial loss. With a view to utilizing ore of low percentage and at the same time readjusting and improving the plant, in order to cover expenses, an investigation board was organized in January, 1920. A group of American scientists and practical engineers, headed by Professor Appleby, of the University of Minnesota, were invited in June, 1921 to Anshan, where they spent more than forty days, and made a thorough investigation into the nature of the ore and its possibilities. Meanwhile, more advanced processes, the so-called hematite reducing system and magnetic concentration system, by which the percentage of iron can be increased to 55 on an average, were invented by one of the Japanese experts attached to the plant. In September, the original plant was modified as follows:

(1) Annual output should be to the extent of 200,000 tons by using two blast furnaces; (2) A large concentration plant should be built; (3) Plants manufacturing by-products, ammonia sulphate, benzol, naphthaline, etc. should be augmented. This readjustment was to be carried out within two years from 1924 at an additional expenditure of Y.11,000,000. The total capital invested from 1919 to March 31, 1927, amounting to Y.45,900,000, has been spent on this iron works, which contain two blast furnaces, four coke ovens, each with a daily capacity of 700 tons; by-products, plants, gas works, electric plant, etc. There are thirty-five miles of railway connecting the mines with the works.

For the fiscal year ending March, 1928, 203,445 tons of pig-iron were produced, an increase of 38,391 tons compared with the former fiscal year. Expenditure for the same period was enormously decreased. Furthermore, the capital stock being reduced from Y.45,000,000 to Y.20,700,000, it was anticipated the loss account on this plant would be converted into a profit account in the fiscal year ending March, 1929.

The following table reveals the general condition of the iron works at Anshan :—

Year	Annual Production Tons	Income Yen	Expenditure Yen	Loss Yen
1919-20	31,620	2,796,224	4,283,392	1,487,168
1920-1	75,273	1,580.655	8,003,233	6,422,577
1921-2	57,184	3,606,999	6,480,725	2,873,726
1922-3	66,543	3,386,935	6,585,278	3,198,343
1923-4	72,311	3,703,690	5,944,588	2,240,897
1924-5	94,501	4,430,753	7,386,361	2,955,607
1925-6	88,263	3,986,931	7,706,920	3,719,989
1926-7	162,455	6,896,504	10,703,098	3,806,594
1927-8	203,454	9,223,114	9,380,656	157,542

In 1928, one more blast furnace having a daily capacity of 500 tons was to be set up. By this the annual production of pig-iron can be increased to 300,000 tons.

South-Western Aviation Corporation Under Organization

A new aviation enterprise, to be known as the South-Western Aviation Corporation, will shortly be organized here under the directorship of Commander Chang Hui-chang, Director of the Aviation Department of the Ministry of War, and Commander Liu Pei-chuan, the well-known Yunnan aviator. Initial expenses for the establishment of the Company have been estimated at $3,000,000. According to the proposed scheme, arrangements will first be made for the installation of a Nanking-Canton-Yunnan air service, expenses for which will be jointly borne by the Kiangsu, Kwangtung and Yunnan Provincial Governments, Branch Offices of the Company will be established in the three centers so as to facilitate administration of the service. In view of the need of preparations at the end of the line in Yunnan, Commander Liu Pei-chuan will shortly leave for Yunnan on his airplane "Golden Horse," by way of Hankow, Changsha and Canton.

South Manchuria Railway Co., Ltd.

Plans for manufacturing sulphate of ammonia by the South Manchuria Railway Co., Ltd. are progressing steadily. According to the report, 100,000 tons of raw material will be obtained from Anshung Iron Works and 200,000 tons from the Showa Seiko K.K. and total production is expected to be about 300,000 tons, an increase of 292,000 tons over the present production of 8,000 tons (of which 5,000 tons from Chufun and 3,000 tons from Anshung). The company will use the Ude method.

The Port of Osaka

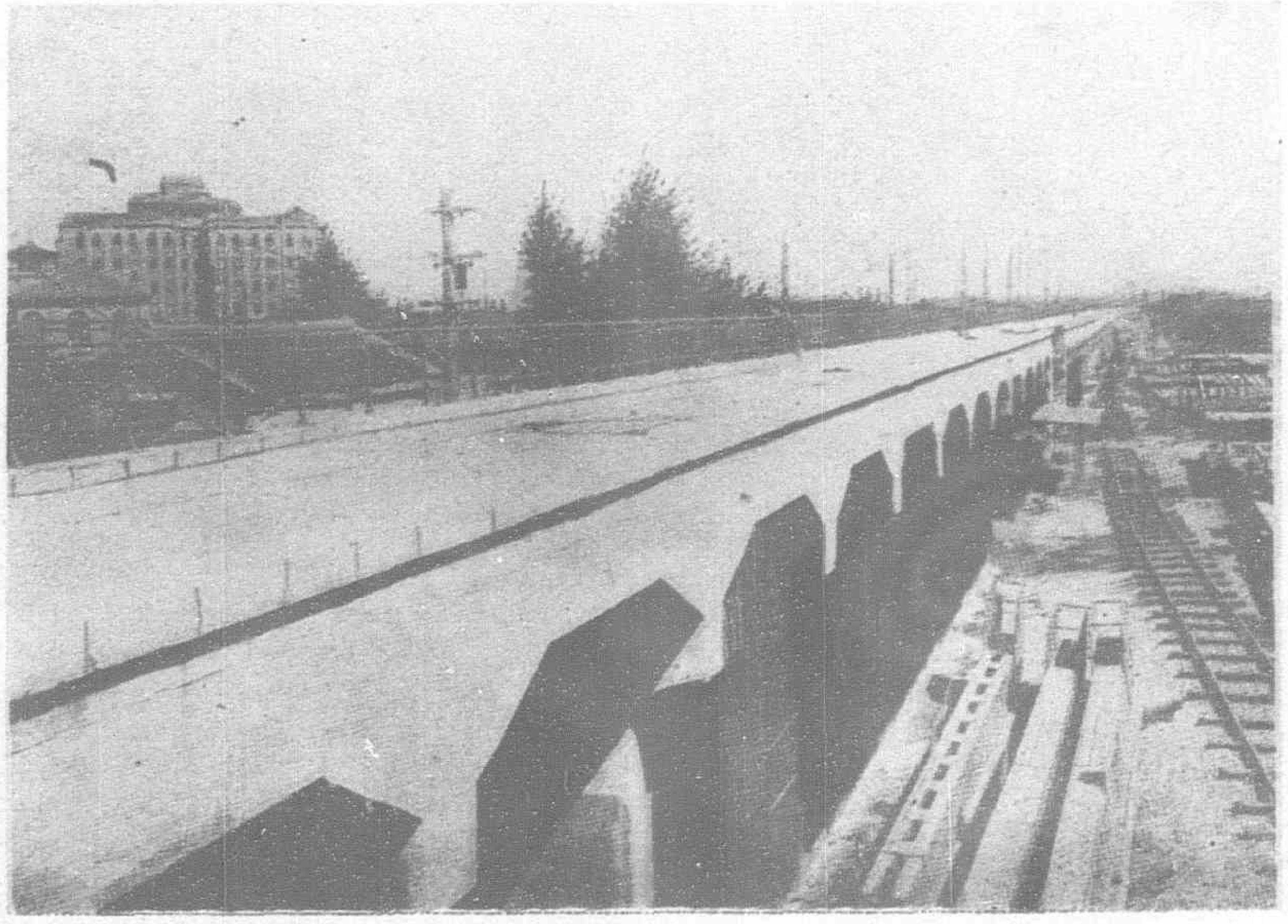
Osaka, having a population of 2,100,000 and an area of 182 square kilometres, is the largest industrial city in the Empire of Japan. The present development of the City started in a remote age, and its harbor has since developed until it is now one of the leading harbors in the country. But formerly it was an insignificant river-port and only small vessels could sail up the Aji River at high tide to the Kawaguchi Wharf. Ocean-going ships rarely visited the harbor, and almost all foreign merchandise entering and leaving the City was handled at the Port of Kobe, being carried by train or lighter between the two cities, much to the disadvantage of merchants in Osaka. This, of course, was due to the fact that there was not sufficient depth of water in the harbor. The river-mouth was frequently silted up as it was not sheltered from wind or wave, and it was feared that this would be a very serious obstacle to the future expansion of the industry of Osaka.

The shipping facilities afforded by the Aji River were found to be quite inadequate to accommodate the increasing volume of shipping in modern times. After careful investigation the Municipality and Government elaborated a plan of port construction, and in 1897 the Municipality commenced work on the new harbor. The cost of the work, amounting to forty million yen by the year 1926, was paid by the City, which had received a subsidy from the National Treasury. Most of the chief port facilities, therefore, are municipal establishments, managed and maintained by the Municipal Harbor Department.

In 1903 a portion of the construction work, namely, breakwaters, landing places, anchorage-ground, etc., was completed, and the new port was opened to the public. The depth of the water then attained was sufficient to enable steamships of 10,000 tons to enter the Port and vessels of 1,000 tons to proceed up the Aji River.

As the result of this epoch-making development, the number and tonnage of vessels calling at the new port increased rapidly year by year, and many shipowners extended their lines to the Port or made Osaka their starting point.

The industrial and financial power of the City has expanded by leaps and bounds. Further important facilities are in course of construction by the Port Authorities to meet the trend towards an ever increasing volume of cargo entering and leaving Osaka. Some of these will be completed shortly, and it is expected that in the near future the Port of Osaka will further consolidate the position which it has achieved in the Oriental trade.



Osaka Harbor Railway Under Construction

Situation :—Osaka is situated in the central part of the Empire, about 16 miles east of Kobe, 27 miles south of Kyoto, and 350 miles south-west of Tokyo, the Capital. Its exact position is Lat. 34° 41′ N., Long. 135° 29′ E.

Natural Features :—The City lies in the delta of the River Yodo, being bounded on the east, north and south by an extensive plain, and on the west by Osaka Bay at the western end of the Inland Sea. Three important tributaries of the River Yodo, namely, the Aji, Kidzu, and Shirinashi, empty themselves into the Bay. The Port has unlimited facilities for transportation by land and water to and from the hinterland.

Water Area :—The water area inside the breakwaters is 65,455 acres.

Depth :—Maximum depth in the above area is 9 metres at mean low water.

Tide and Soil :—Maximum high tide, + 2.05 metres, average high tide, + 1.44 metres, minimum low tide,—0.59 metre.

The sea-bed is of mud and ensures a safe anchorage for ships.

Anchor Buoys :—The number of buoys and their berthing capacity are as follows :—

	Berthing Capacity	
Number	Length (Metres)	Tonnage
South No. 1 to 8	180	15,000
South No. 9 to 15	150	10,000
Extra No. 1 to 4	200	20,000
North No. 1	150	10,000
North No. 2 North No. 3	130	7,000
North No. 4	120	5,000
North No. 5	120	5,000

Dues for Buoys :

Vessels of less than 1,500 tons, Y.6 per 24 hours.
,, ,, 5,000 ,, Y.8 ,,
,, ,, 10,000 ,, Y.12 ,,
,, more than 10,000 ,, Y.18 ,,

Piers and Quays :—The following are the principal piers and quays :—

Main Landing Pier :—Length 455 metres, width 27 metres, height from water at L.W. 3.2 metres, depth of water at L.W. 9.6 metres. Used for both passengers and cargo.

Sakurajima Pier :—Length 275 metres, width 11 metres, height from water at L.W. 2.9 metres depth of water at L.W. 9 metres. There are many warehouses behind the Pier, most of which are managed by the Mitsubishi Warehouse Co.

They are well served by side-tracks.

No. 1 Quay :—Length 436 metres, width 18 metres, height from water at L.W. 3.5 metres, depth of water at L.W. 9 to 10 metres. Just recently completed. A project for a warehouse zone on the wharf behind the Quay has been approved, and will be managed by the Sumitomo Warehouse Co.

Some of the structures planned, namely, transit sheds, warehouses, cargo handling machinery, etc., have already been erected.

Side-tracks will be laid shortly. In the very near future it is anticipated that this region will become one of the most important terminals of the Port.

Tempozan Pier :—Length 127 metres, width 9 metres, height from water at L.W. 2.6 metres, depth of water at L.W. 6 metres. Used chiefly for coastwise passenger-ships.

Wharfage :—Tempozan Pier, 1/10 sen per registered ton for an hour.

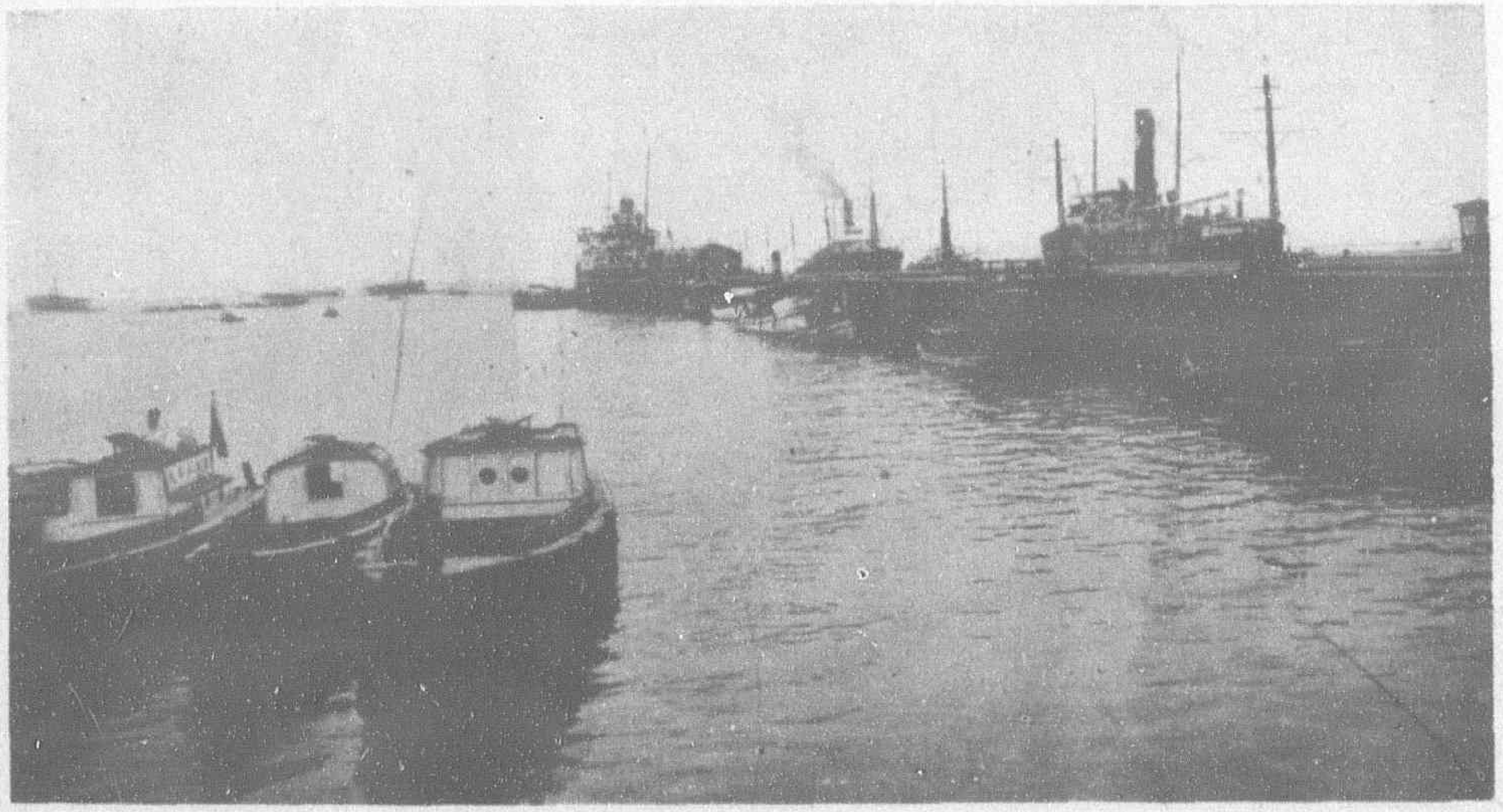
Others, 1 sen per registered ton for 24 hours.

Cranes :—There are several municipal cranes, travelling or floating.

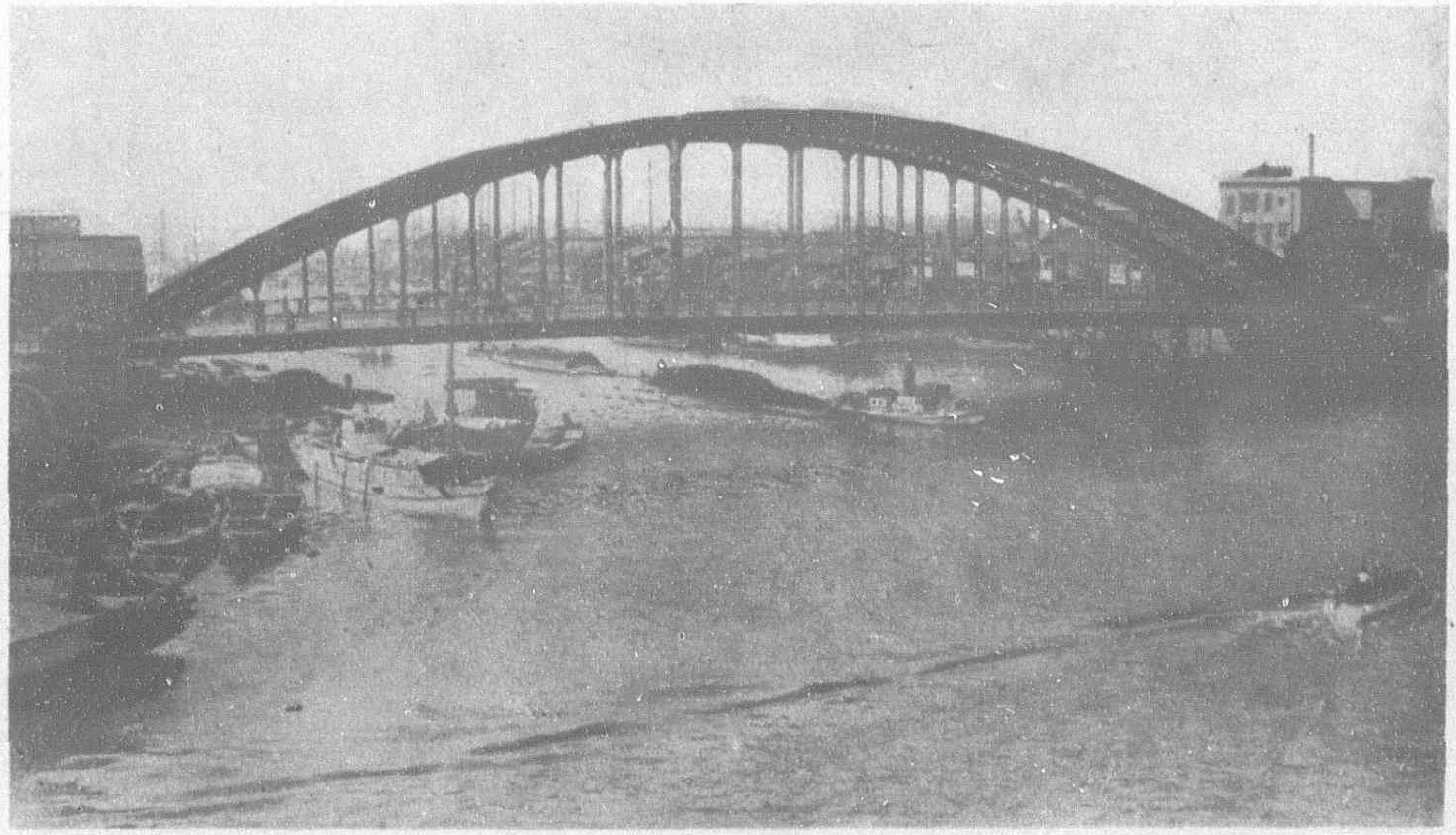
Charge for Cranes :—2.5 tons travelling, Y. 3 per hour ; 10 tons floating, Y. 15 per hour ; 20 tons floating, Y. 25 per hour.

Transit Sheds, Warehouses, Bonded Warehouses, and Principal Warehouse Companies :—The cargo storing accommodation at the Port is very large in the aggregate. Transit sheds and warehouses in adequate numbers have been established on the

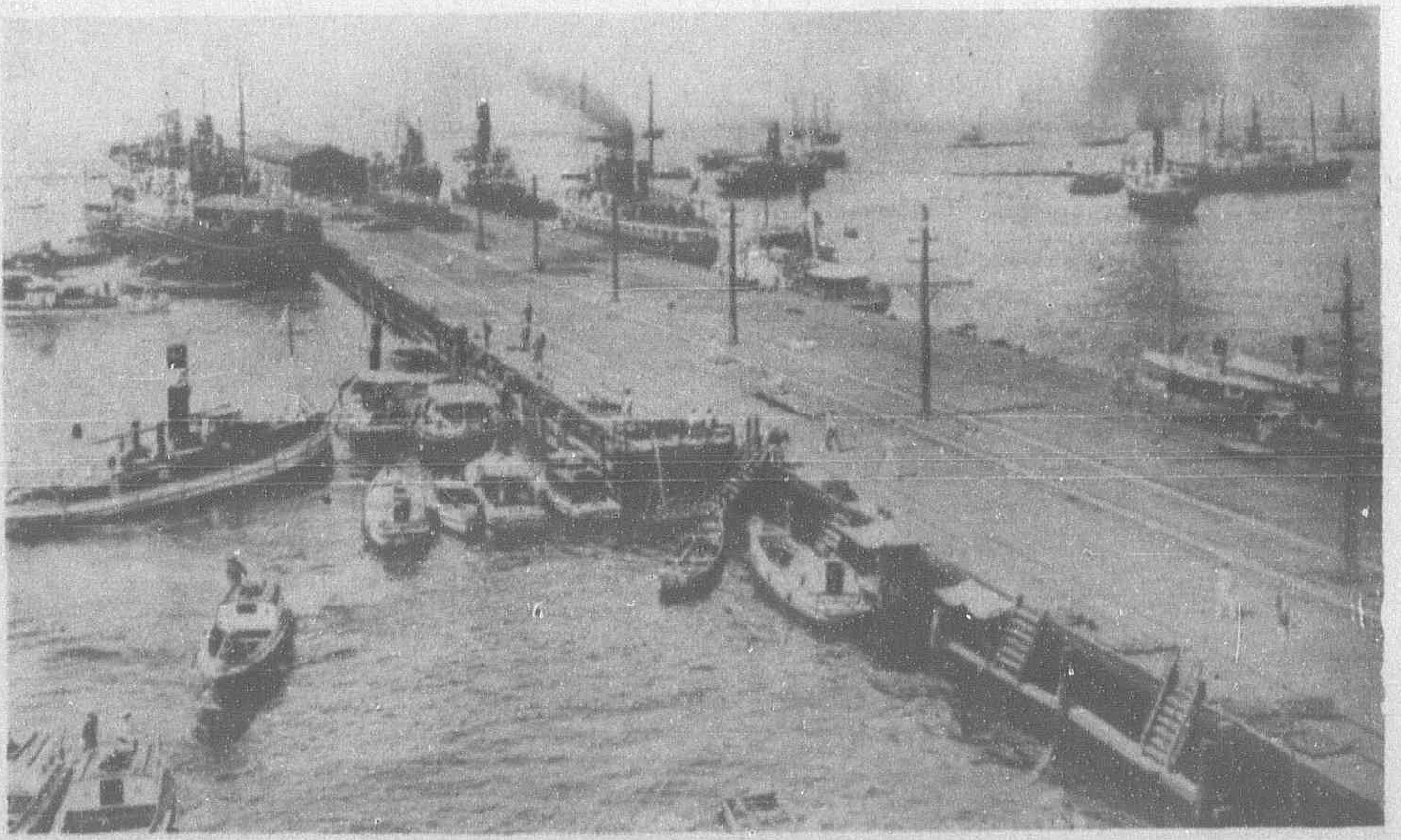
FOUR VIEWS OF THE MODERN PORT OF OSAKA



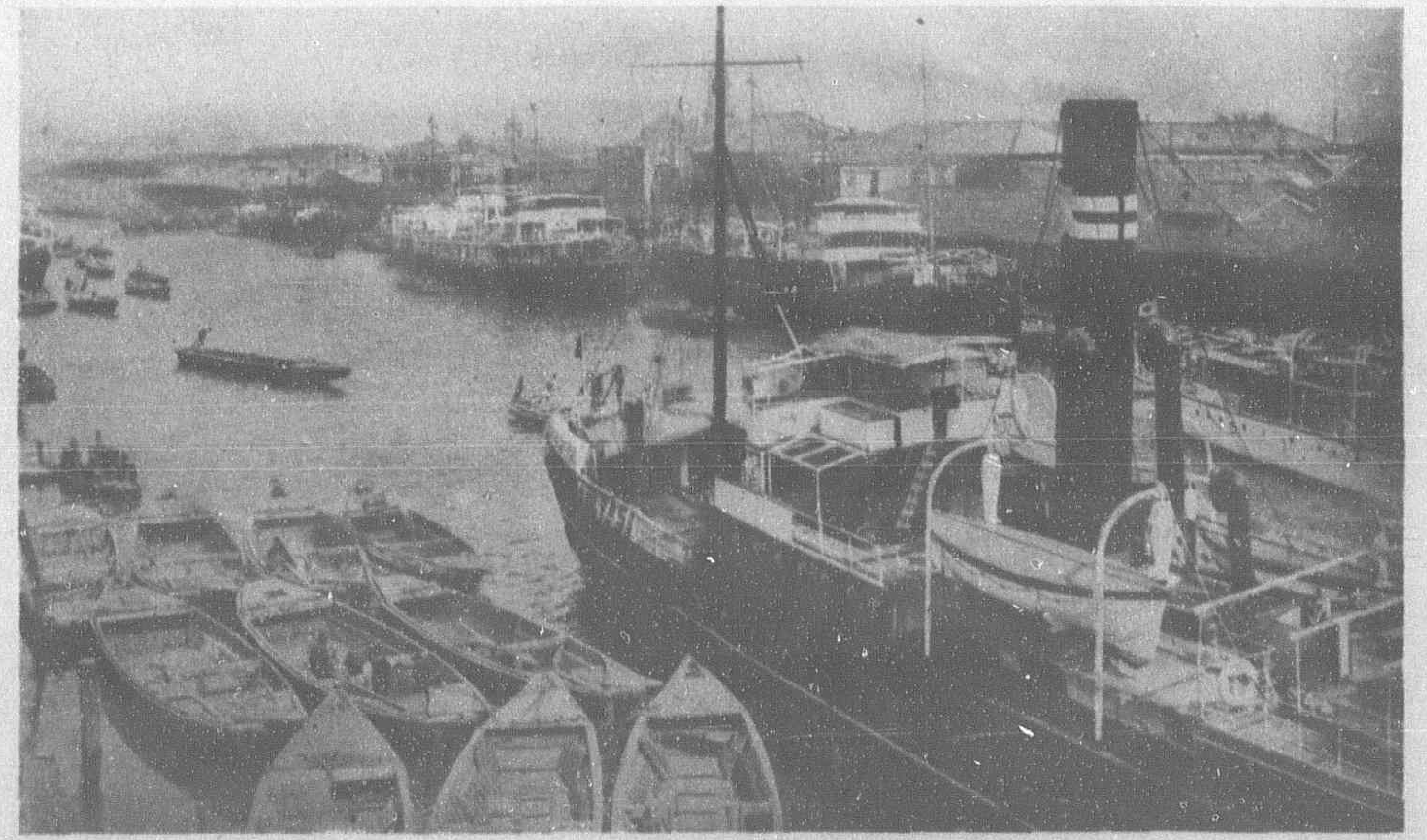
1 "Osaka Pier"



2 The Taisho Iron Bridge, Osaka



3 The Osaka Harbor Construction



4 Estuary of the River Ajikawa, Osaka

wharves and bonded warehouses have been erected at various places for dealing with foreign trade.

The Mitsubishi, Sugimura, Sumitomo, Taisho Unyu, and Toshin are the leading warehouse companies at the Port.

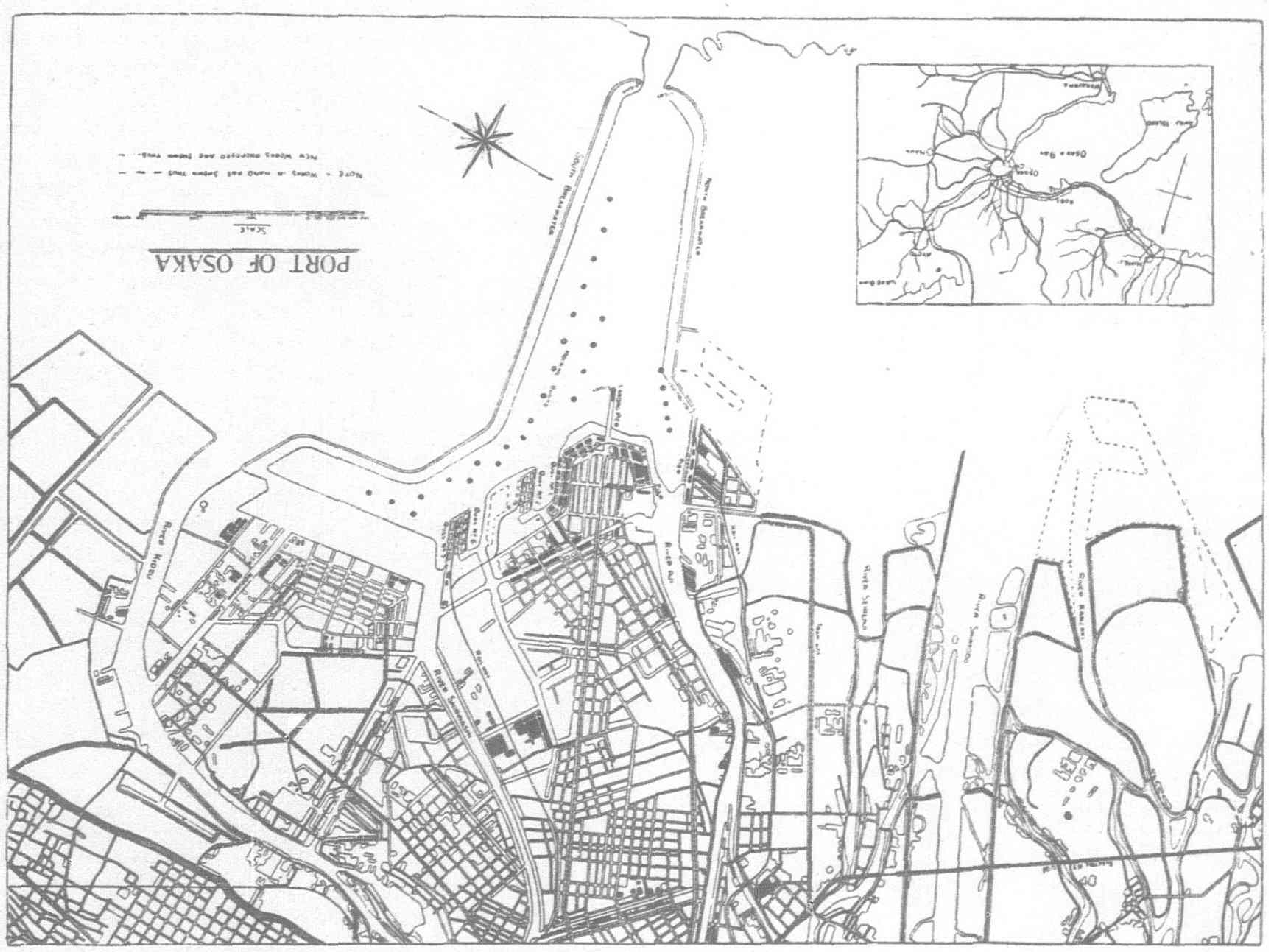
WATER SUPPLY :—The water supply is controlled by the Municipality. Fresh city water is supplied to ships by means of tank boats or direct from the main as occasion requires.

Charge for Water :

By tank boat, 42 sen per ton.

Direct from the main, 28 sen per ton.

RAILWAY :—The harbor railway starts from Sakurajima and extends to Umeda, the central station of the City, passing through the industrial district on the north side of the Aji River. Coal, raw cotton, and other general cargo for the hinterland are easily transported by this route. Sakurajima is one of the important terminals at the Port and is used as a landing place, as is also Kawakishi-cho on the north side of the River.



LIGHTERAGE:—Lighterage in the harbor has a special significance in the system of transportation. With rivers and canals running through the City and its suburbs, the trade of Osaka is largely waterborne, and the principal factories, markets, and warehouses have an economical and convenient means of transportation by lighter, for there is usually some water-way in the vicinity connecting with the harbor. Lighterage has therefore developed extensively, and this is one of the reasons why the practice of handling cargo at sea is flourishing at the Port.

COALING-DEPOT :—The coaling-depôt at Sakurajima is managed by the Railway Department. Another has just been completed at the mouth of the Shirinashi River, and is managed by Kaishima Shogyo Co. Each has one or two coal conveyers.

HINTERLAND :—The City, having a large population of 2,100,000, needs an enormous quantity of goods. In addition, the neighboring prefectures, which are very densely populated and contain many cities and towns within their limits, comprise the most important industrial district in Japan and Osaka is its centre. Such is the hinterland of the Port. It depends upon Osaka for the supply of foodstuffs and raw materials, and at the same time, Osaka serves as a concentrating point for the distribution of its products and manufactures at home or abroad. The same may be said of many small ports on the Inland Sea, all of which have an important connection with Osaka for the supply of goods and the sale of their products.

Mining in Hongkong

FROM a reliable source, the *Daily Press* learns that a scheme is shortly to be launched to mine and smelt iron in the Colony.

Capital to the extent of about $1,000,000 may be invested by one of the British firms in the Colony in the project, and a large Japanese mining concern has also expressed interest in the scheme. Their surveyor is at present in Malaya investigating a large deposit and, when negotiations there are completed, he will visit the site of the proposed mine in the New Territories, and prepare a comprehensive report on his observations, which will be forwarded to Tokyo.

It is said that the deposit will give ore which will produce at least 100,000 tons of iron of good quality but this is only an approximate preliminary estimate, and the surveyors who have reported on the mine are inclined to adopt more sanguine views.

Arrangements are being made for the establishment of two large electric blast-furnaces in the Colony. It is anticipated that this will have a far-reaching effect upon local market prices of iron and, if certain experiments are successful, steel of good quality for building purposes may be produced in fairly large quantities.

Steps may be also taken in the near future to revive the mining of tungsten ore. According to a well-known local geologist and prospector, the New Territories contain many deposits of ore. Immediately after the War a slump set in, and various mining concerns in the Far East were left with large stocks on their hands. This has been now almost disposed of, and mines in the North are likely to be worked again as soon as the political crisis is ended.

Yet another scheme to develop the mineral wealth of the New Territories is receiving earnest attention from experts. Quartz which has little value for other purposes can be crushed and used for glassmaking. At present most of the glass made in the Colony is manufactured from broken and scrap glass imported from Europe and America. Naturally, this results in an almost prohibitive price being charged for locally-manufactured glass.

Small quantities of sand for glass-making are imported from Kwangsi and other nearby provinces, but the Chinese provincial tariffs are so high that this proposition is even less profitable than importing broken glass. If successful, the new scheme will make the manufacture of glass locally a most attractive proposition.

It is estimated that the yield from crushed quartz will be well-nigh inexhaustible, while the close proximity of huge quantities to various foreshores makes the question of transport to the local factories an easy and cheap one to solve.

Nanking-Kansu Line

Far distant Kansu is to be linked to Nanking and Shanghai by regular Airplane service. The China Association for the Advancement of Aeronautics in a memorandum to the Ministry of War petitions for permission to organize a Nanking-Lanchow Commercial Air Service Company, Ltd., which will operate an air mail and passenger service between the Capital and Lanchow, provincial capital of Kansu, with stations at Chengchow (Honan) and Sianfu (Shensi).

According to the memorandum, a sum of $300,000 has already been pledged by the promoters who are planning to purchase three large commercial planes from abroad for the early inauguration of the Company.—*Kuo-Min.*

Present Status and Future Outlook of the Chinese Tungsten Industry

By TAM WAH DING

Authorities on China have time and again expressed the fact that this country possesses untold riches in mineral resources. The production of a Tungsten Ore, technically known as Wolframite, is a shining example of China's unlimited wealth in mineral resources. Up to 1915, the world knew little about Tungsten, especially from a commercial viewpoint; and it was not until 1917, in the midst of the World War, that the economical importance of the Tungsten Industry was realized.

In 1916, China first produced 120 tons of Tungsten in the form of Wolframite. In 1917, she produced something like 1,500 tons and in 1918, she exported 10,500 tons of this mineral, which was then valued to approximately G$16,000,000; this fact made her the world's largest producer of tungsten ores.

Occurrences

Tungsten Ore is mined in South China, in the provinces of Kiangsi, Kwangtung and Honan, particularly in localities close to and along the border lines separating these three provinces. In Kiangsi, tungsten deposits are found in the southern part, in the districts of Lungnamshan, Tinam, Sinfenhsien, Nankanghsien and Taiyu. At present this province produces most of the tungsten ore. In Kwangtung, deposits are found in both the northern and eastern parts of the province. In the northern part, the most important districts are Lokchong, Namyung, Chihung and Chukiang, and in the eastern part, Wuwha, Hungninghsien, Kaiyung, Heifung, Lukfung and Wailia. In the province of Honan, deposits occurred in the southern part at Hangchow and vicinity. The districts above mentioned are only those in which chief mining operations have been carried on. There are large tungsten deposits in many other areas of the three provinces which have not as yet opened or, rather, the deposits are being mined in a very insignificant scale.

Mines and Mining Methods

As above stated, the Tungsten mineral mined is in the form of Wolframite, which occurs either as sands and pebbles in the streams or in the small veins in granite rocks. In the former deposits, the ore is found as placer stuff, where the veins have been broken down and the materials in them washed away, leaving the wolframite in the dirt and stream beds. However, in the latter deposits, the wolframite is in the form of veins, ranging in thickness from a fraction of an inch to three or four inches. The mineral of Tungsten placers are sometimes accompanied by Cassiterite and Magnetite. In the past, the greatest bulk of the ore has been derived from placers, but the future supply of the wolframite will come from mining the veins.

At present there is no scientific method inaugurated for mining the ores. Rakes, toms and pans are used for securing and washing the stream ores, while in the case of vein ores, hand hammers, drills and sometimes black powder are used for extracting the valuable ores from rocks. The ores thus offered for the market are rather impure and usually have to be reconcentrated to bring the $W0_3$ contents up to 67-72 per cent. for export purposes.

The successful development of tungsten mining will depend upon the economical uses of scientific equipment together with mine-engineering experts, who will dare themselves to go into the unsettled mining districts. Of course, an enterprise of this nature calls for the support of a stable government. Heretofore, tungsten mining has been conducted by farmers of their respective districts, and the lack of knowledge of modern mining methods by this class of people no doubt created a great waste in the industry.

Marketing Methods

In the past, the methods of marketing the tungsten ores have been very complicated and were done as follows:

The farmers or miners took their concentrated ores to the local markets of their respective districts and disposed them to dealers at the best prices obtainable. The local dealers in turn sold the ores to licensed collectors of the Government Tungsten Bureau. These licensed collectors had to secure a license and paid a tax to the Government. They, after shipping the ores from the village districts to their own respective ports, were under obligation to sell the ores for export trade within a certain period, the longest time being three months. If shipment was not made after the expiration of that period, the licensed collectors must renew the tax or forfeit the ores to the Government. These licensed collectors sold the tungsten ores to foreign export firms in various ports, who in turn exported same to European and American markets. The Government Tungsten Bureau, with its licensed collectors, have been looked upon by the miners and exporters as more or less interferences on the part of the governmental and military authorities, with the result that much smuggling of the ores and direct trading with the foreign exporters were being done.

Very recently the Kiangsi and Kwangtung Governments, acting through their provincial Department of Reconstruction, in an endeavor to improve the local marketing conditions and to prevent further smuggling of the ores, entered into an agreement with a certain private organization for the sole purpose of directly buying and selling the tungsten ores. Details of this agreement are not known, but it is known that the private organization in question is to hold an exclusive franchise for five years, during which time the Government is to receive in advance an annual remittance of $55,000, plus an annual increase of $6,000, until the fifth year, in which the Government is to receive $79,000. When this scheme was disclosed to the public, great reactions existed among the miners in Kwangtung Province, their opposition being so firm that it would enable them to be successful in getting the Government to cancel the exclusive marketing franchise.

Factors to Better Development

It seems that the present development of the tungsten industry in China is handicapped by, firstly, poor mining methods, secondly, Government monopoly and restrictions and lastly, the lack of effective business organizations capable of handling and developing foreign trade.

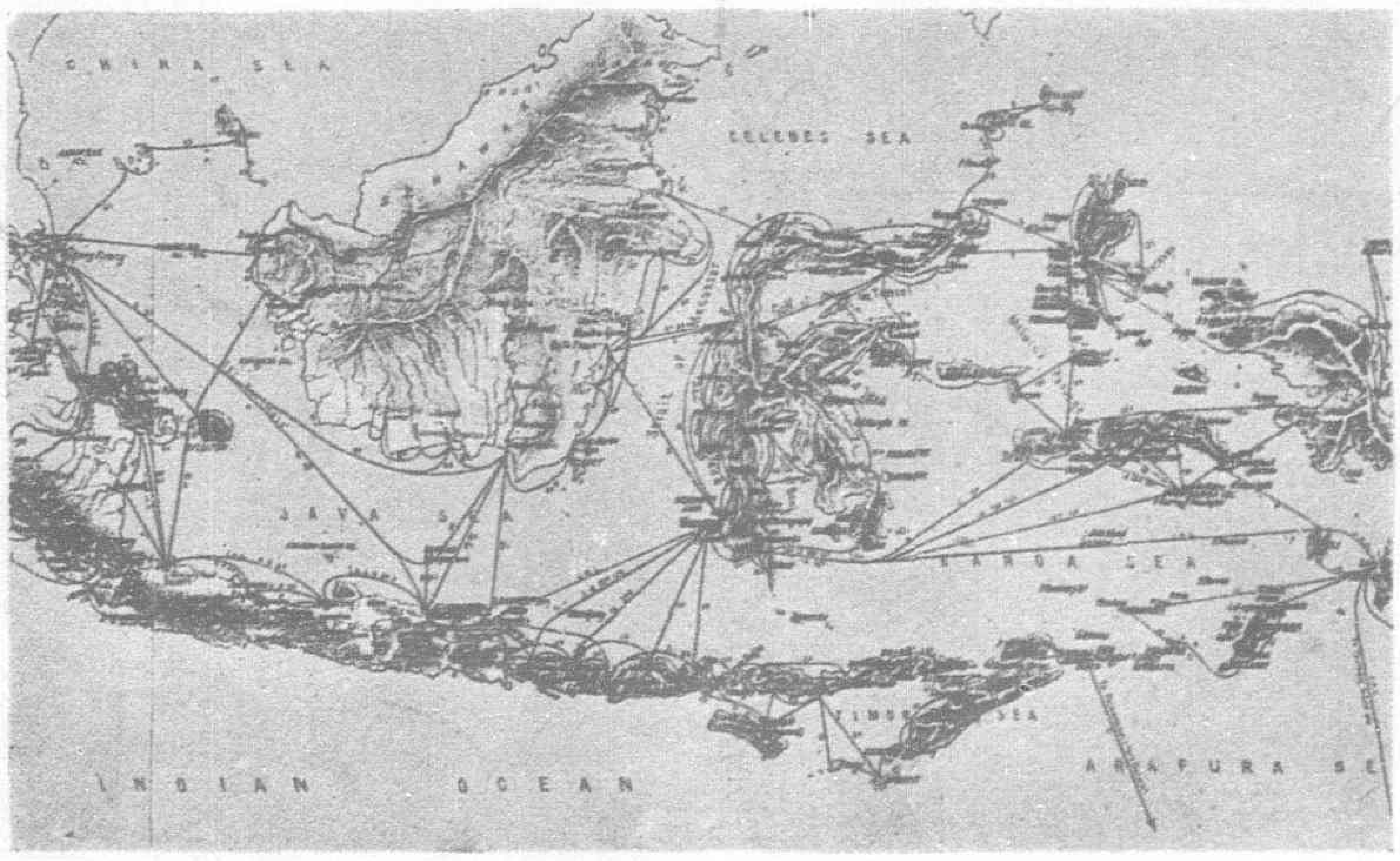
The tungsten mining industry in China is only of recent origin and it would be very unwise for the Government to place any sort of restriction on it. As a matter of fact, the mining industry in China as a whole needs laws of encouragement. Discoverers of valuable minerals should get full title to the mining claims, and moreover, should be rewarded with some sort of Governmental title for having made the discovery. After the mineral is discovered, the mines should not be ranked as public property, but as private industry, to be fostered and regulated like all economic industries. The Government should not reserve any royalty or attempt any supervision on same. Upon issuance of the deeds of sale by the Government, mining estates will become private properties. Only under this principle can the mining industry in general, and the tungsten mining industry in particular, prosper.

China has become the world's largest tungsten producer since the World War and in order that she be able to maintain this leadership among the nations of the world, she must have not only proper Government administration of the mines but also Government help in the way of providing ships to command preferential rights for shipping. Then the Government itself must

(Continued on page 521)

Inter-Island Shipping of The Dutch East Indies

Regular and numerous means of communication between the various parts of the Archipelago, the number of islands in which is exceeded by no other similar island-group, is matter of the greatest importance for the welfare of the Colony. In view of the rapid progress enjoyed by Netherlands East India, and of the equally increasing administrative activity—especially in recent times—in all parts of the Archipelago, it is not surprising that this local sea traffic has attained to a very great degree of development. During about the middle of last century the available means of communication still consisted principally of sailing ships of low tonnage, while the service connecting Batavia with the various parts of the Colony was maintained by some fourteen steamships. These steamships were in private hands and were subsidized by the Government. This method has continued to form the means whereby it has been found possible to maintain the necessary communications between the various islands. The Government also now has at its disposal a large number of steamers of its own, but these are principally utilized for administrative purposes.



A Steamship Map of the Dutch East Indies

The companies which successively engaged in this traffic, and which are now of continuously increasing importance, attempted at first to exclude all foreign competition. Previous to the date of the opening of the Suez Canal (1869) this was not a difficult matter; subsequently, however, there developed a local service under the British flag, which still plays a considerable role in the intercolonial traffic. This has resulted in several of the larger steamship lines, which connect the Archipelago with abroad, touching at a large number of the ports in the Colony.

Foremost in the list of companies engaged in developing this traffic stands the Government-subsidized "Koninklijke Paketvaart Maatschappij" (Royal Packet Navigation Company), founded by the Directors of the "Nederland" and "Rotterdam Lloyd" Steamship lines (which will be further dealt with below), whose object in doing so was to create "feeders" for their service to Holland. Although the activities of the company include freight and passenger services to Penang, Singapore and Australia, as well as an irregular service of freight-steamers between Java and Bangkok (Siam), its primary object—in which respect it is unique—is to foster traffic between the islands of the Archipelago. The Company was founded at Amsterdam in 1888, and since January 1, 1891 has been entrusted with the carrying of the mails throughout the entire Archipelago. The agreement concluded with the Government laid the Company under the obligation of instituting steamship services on thirteen different routes. The stipulations made at that time regarding the capacity of the ships are remarkable, when one compares them with the capacity of the ships now run by the Company. Such a comparison shows one at a glance the enormous increase that has taken place in the inter-insular traffic. The largest ships that the Company was required by the provisions of the Government contract just mentioned to maintain in its service, had to provide accommodations for 12 first-class passengers, 12 second-class, 40 third-class and 120 fourth-class passengers; the capacity of the holds was required to be not less than 120 tons. The Company commenced operations with 16 steamships taken over from its predecessor, to which number were added 13 ships built in Holland; it now has at its disposal more than 90 steamers, the largest of which have a capacity of 5,000 tons.

It is obvious that so rapid an extension of its programme and of its fleet cannot possibly have been a result solely of opportunities having continually arisen to institute new services of an indisputably profitable character. Herein indeed lies one of the chief services rendered by the Company, *viz.* that in opening up new routes, the question of whether any immediate financial advantage would ensue has not been, and still is not allowed to form a decisive factor. Of course it will be understood that the institution of such new services would not be proceeded with unless there were reasonable grounds for anticipating that in the long run their development would prove profitable; to that extent the "Paketvaart" is a commercial undertaking, but its Directors have never hesitated to sacrifice a portion of the Company's profits in order to test by experiment whether new routes could be instituted—an experiment in some cases of several years' duration. As can easily be imagined this policy has been of the greatest benefit to the development and progress of all parts of the Archipelago, and in carrying it into effect the Company has, wherever necessary, not failed to receive the Government's hearty support. The Government indeed takes a very great interest in the extension of inter-insular shipping facilities. This interest on the part of the Government is concerned not only with the possibility that arises for the ports and districts thus served by the "Paketvaart" to be developed and generally opened up, but also with the performance by the Company of certain Government services stipulated in the agreement. Thus in the first place the "Paketvaart" is entrusted with the mail-service; then it is required on certain routes enumerated in the contract to transport passengers, goods and bullion for the Government, and in special circumstances the Government is empowered to charter the Company's ships at a moment's notice, or even to requisition and purchase them outright. The right to charter or hold up the ships may be exercised by the chief civil authority at all ports touched at by the Company's ships if occasion to do so should arise, *e.g.* for the purposes of the mail service, or in the interests of the maintenance of the public peace, or in case of disaster or threatening danger. For the transport of Government passengers and goods a fixed tariff has been agreed upon; the Company is under obligation to carry also other passengers and goods, so far as accommodation will permit, at rates which may not be more than 10 per cent. resp. 25 per cent. above the tariffs fixed for Government passenger and freight transport. The times of departure from the starting ports in each route are determined by the Chief of the Postal, Telegraph and Telephone Service in consultation with the Company. The subsidy is granted according to a tariff for the various routes, being calculated at so much per geographical mile traversed. The Governor-General is authorized (subject to legislative confirmaticon) to require the institution of new services, and likewise to demand alterations in or the cessation of existing services. As a result of the good accommodation provided for passengers, the Company has managed to acquire a practical monopoly of the passenger traffic, except on the routes which are also served by the great foreign steamship lines. As regard the goods traffic, however, the Company has had to meet very extensive competition. The

Tanjen Priok, the Outpost of Batavia and Weltevreden, is the Starting Point for all Journeys from Java to Foreign Countries, and to the Many Islands of the Group of which Java is the Best Known

increase in the passenger traffic will probably before very long lead to a separation of the passenger service from the goods service on some of the most frequented routes.

The coastal shipping trade, which gives rise to a great deal of competition so far as goods traffic is concerned, has since the middle of 1912 been available to ships under any flag between those ports which are open to general commerce. Between ports which do not come under that category the coasting trade can only be carried on by Dutch ships, by ships registered in Netherlands India, or by native boats. There are now more than 70 ports in the Archipelago open to general trade, while the port of the islands of Rhio is a free port. Furthermore all ships have access to the native ports, that is to say harbors in those portions of the Archipelago which are not directly under Dutch rule but are governed by native princes or chiefs.

The river shipping traffic is of considerable importance, especially in Sumatra and Borneo.

Mention must be made here of the Government Marine service, which, although its primary object is not the promotion of intercommunication between the various islands, yet indirectly contributes to that end. The title just used must not be understood to refer to the section of the Dutch navy stationed in Netherlands Indian waters. The Government Marine consists of a fleet of smaller vessels, which form an essential means of assisting the administration of the islands. These ships are used principally for the transport of officials and officers, of government goods and bullion, as well as for maintaining police surveillance within territorial waters, and for countless other services the need for which arises in connection with the work of administration. The police marine inspectors are engaged, in addition to other duties, in preventing illicit trade in opium. The staff of the Government Marine service, who are, of course, very well acquainted with the general state of the islands, are frequently used for other services; thus for example a captain in the Government Marine was placed in command of a steamer that serves as "examination vessel" to investigate fisheries, while members of the staff are often detached for duty on board the ships of the marine survey and on lightships. The Government further have a cable ship at their disposal.

Present Status and Future Outlook of the Chinese Tungsten Industry

(Continued from page 519)

have internal peace and order, whereby it can give the country a uniform and stable currency. Without this peace and order, modern mining methods will not develop and effective business organization will not grow to any extent.

China as yet is not able to consume, within her own border, the production of tungsten ores and consequently have to look for foreign markets, where shipping and currency play the most important part. For this reason, every effort and encouragement should be given at home to the organization of the most efficient and economical methods for producing and marketing of the highest quality tungsten ores, in order that the foreign markets may be commanded with advantage.

Recent developments in the field of foreign commerce emphasize the need of effective organization and special training to compete successfully in the world's commerce. As seen above, marketing methods of the Chinese tungsten industry are sadly in need of an effective commercial organization. From the foreign exporters to the miners, there are too many intermediaries, none of whom know the characteristics of the tungsten ore as demanded by foreign markets. The little informations held by the foreign exporters have always been kept secret, with the result that dissatisfaction grew out on the part of the Chinese on the attitude and terms of the foreign exporter. The logical organization, then, for handling and developing the markets abroad, will be a commercial organization with Chinese in full control, who can handle directly the buying of the ores from the miners and exporting them to foreign markets. The miners may partially or fully participate in the organization, but the middlemen, licensed collectors, as well as the foreign export firms, must make way for this organization. In fact, this is a normal step in the progress of foreign trade in China. Chinese merchants will be expected to assume a direct control in the trade of their own country, as was the case in Japan and every other progressive nation. Economics demands it. Given some training in foreign trade. the facilities of the international credit system, guarantees and understanding of business procedure and development of native banking institutions, the commerce of China will find its way logically into her people's own control and it will not be long to witness such a situation in China. Then, and not until then, will the marketing and exportation of tungsten ores be satisfactorily handled.

Uses of Tungsten

Modern civilization has derived great benefits from the applications of tungsten products. As tungsten steel, it has played a wonderful part in civilization. Armour plates, projectiles, firearms, automotive parts and high-speed cutting tools are examples of its chief uses. As metallic tungsten, it has given birth to the present tungsten filament electric lamps, whereby greater illumination, longer life and lower current consumption have been attained. Contact points of all ignition devices are now made of metallic tungsten. The salts of tungsten find uses too numerous to enumerate. Coloring agents for glass and porcelain, decorative materials for brass and bronze, mordants and fireproofing agents in the textile industries, and brilliant lakes in paint and dyestuff industries, are a few of their uses.

Mankind will derive still greater benefits from the tungsten products if the ores can be placed in the hands of manufacturers at lower cost and better quality, which China can do very readily by giving facilities to manufacture such semi-finished products as ferro-tungsten and tungsten salts, since the raw materials are at her doors.

A Vickers-Engined Japanese Ship

The "Midori Maru," One of Four Vessels for a Daily Passenger Service on the Inland Sea

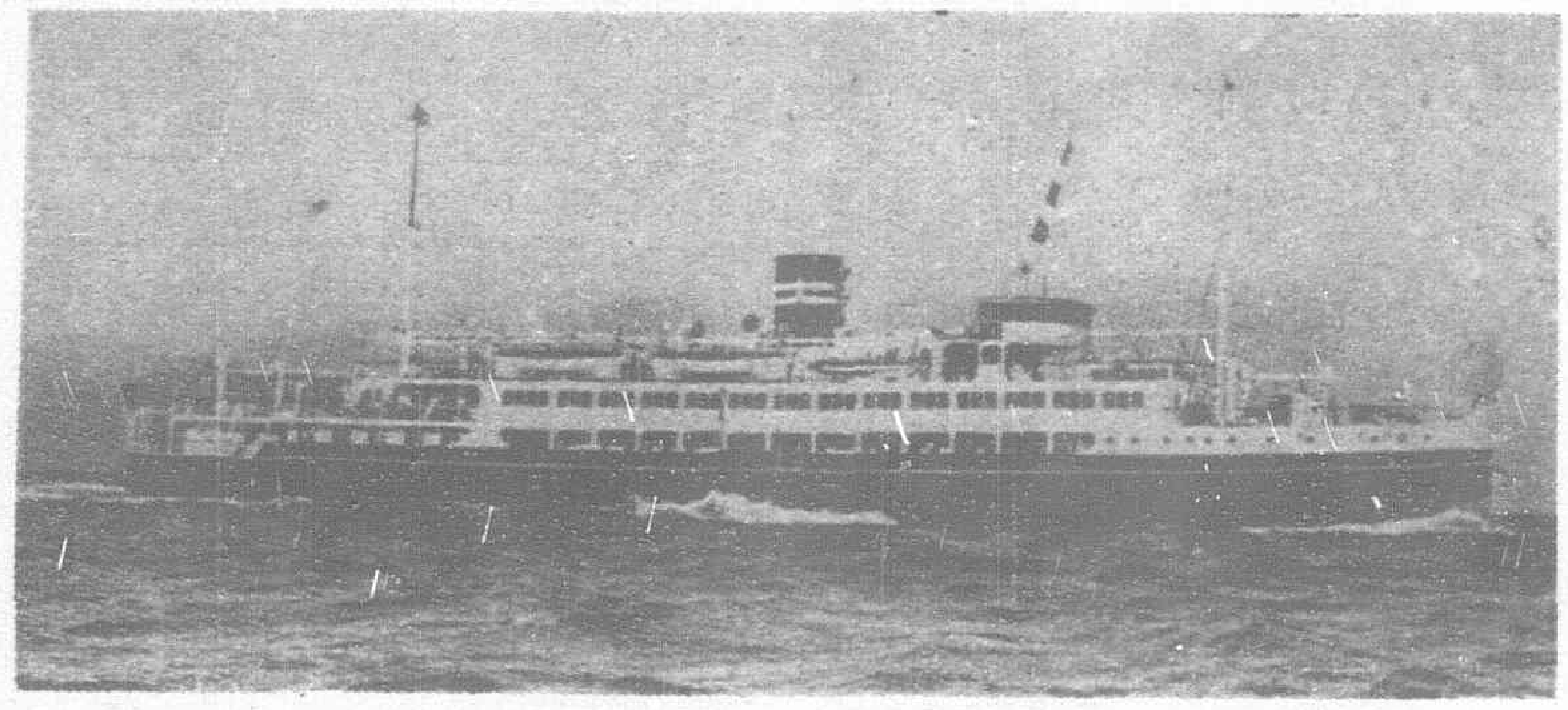
IN 1924 the Osaka Shosen Kaisha constructed the motor passenger vessel *Kurenai Maru* for service between Osaka and Beppu on the Inland Sea. They have recently taken delivery of another ship, *Midori Maru*, and a third, the *Sumire Maru*, has been launched and will shortly be completed. These, together with a steamer built in 1921, are to maintain a regular service involving two sailings a day each way between Osaka and Beppu.

The *Midori Maru* and *Sumire Maru* are slightly larger than the other ships, and are of interest as they are equipped with Japanese-built engines of British design.

The following are the main details of the two ships :—

Length overall ..	256-ft.
Length b.p. ..	243-ft.
Beam	38-ft.
Loaded draught..	11-ft. 9-in.
Gross tonnage ..	1,720
Speed on service..	15 knots.
Engine power ..	1,900 b.h.p.

In each ship there are two engines developing 950 b.h.p. each, and they are of the four-stroke trunk-piston airless-injection class. They are of the Vickers type and were built at the Kobe works of the Mitsubishi Zosen Kaisha; they have eight cylinders 425 mm. bore with a piston stroke of 620 mm., the normal output being developed at 210 r.p.m.



The "Midori Maru"

Living Room of "Midori Maru"

The auxiliary dynamos are coupled to M.A.N. airless-injection engines, the generators developing 35 k.w. at 325 r.p.m. The main engines differ from normal design in that the lubricating-oil and fuel pumps, cooling-water pump, a bilge and a sanitary pump are driven direct. The windlass, capstan and steering gear are electrically driven.

Accommodation is provided for 46 first-class passengers, 148 in the second class and 535 third-class passengers. The decoration is mainly suited to European taste so far as the first-class state-rooms are concerned, for of these 17, as well as one cabin-de-luxe, are fitted in European style.

Modern Office Appliances in Japan

WRITING in the 25th Anniversary Number of "Office Appliances," Mr. Teijoro Kurosawa, head of the office appliance house that bears his name in Tokyo, says that thirty years ago this house was established to supply Japanese business with modern office equipment. We were among the first, if not the very first, to introduce and distribute in Japan the modern systems and equipment which make for higher office efficiency. Thus the writer has personally and intimately passed through and been a part of Japan's development from a country with practically no modern office equipment to a nation which uses in its business offices every machine, device, and system which the world offers and which is usable to advantage under the conditions which obtain here.

Had I had such a subject as this to write upon six years ago, I could have supplied exact details and statistics on the developments in the use of office equipment in Japan during the previous quarter of a century. But unfortunately most of my records and information, which had been gathered over a period of two and a half decades, were destroyed in the terrible earthquake of 1923. Therefore, I shall in this article neither bore the reader with statistics nor risk an attempt at making from memory detailed statements which might not be exact. However, developments in Japan cannot perhaps be better summarized than by the idea presented in the last sentence of the previous paragraph.

Japan has within the present century become one of the foremost industrial nations of the world. It has been ready and willing to adopt modern methods as fast as they have made their appearance. One of the most important factors in the spread of modern office equipment not only in Japan, but throughout the world, has been the remarkable progress of transportation and other means of communication in the past quarter century. It is this closer contact between nations that has made international trade to-day as easy and simple as was trade within national boundaries twenty-five years ago. Thus, nearly everything new in business equipment in the United States has come to Japan freely and with little loss of time, and Japanese business men have had the progressiveness and foresight to make the best possible use of whatever the world in general and the United States in particular have offered.

In short, what was strange and rare here twenty-five years ago has become ordinary and abundant to-day, and the efficiency and economy resulting from the use of up-to-date office equipment are acknowledged as necessary for the progressive business establishment. However, this statement must not be taken to mean that office equipment requirements in this country are identical with those of the United States. On the contrary, Japan's office equipment needs are in many respects unique and it is only by careful study of Japan's national peculiarities that one can properly understand the significance of the country's exports and imports.

To illustrate : Perhaps the most important part of modern business is correspondence which, of course, involves the use of the language of the country. Hence the typewriter most commonly used in a country must write the language of the country and therefore has points of difference from typewriters for writing other languages. This is particularly true of Japan and the Japanese language, which differs fundamentally from English and other European languages. In our language we use several thousand ideographic characters, as well as forty-eight letters of the phonetic alphabet (Kana). The ideographic characters were brought to

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The New Law Courts, Johore Bahru

THE New Law Courts building which has recently been completed is the largest of a considerable number of new buildings, erected lately, or now under construction for the Government of the State of Johore.

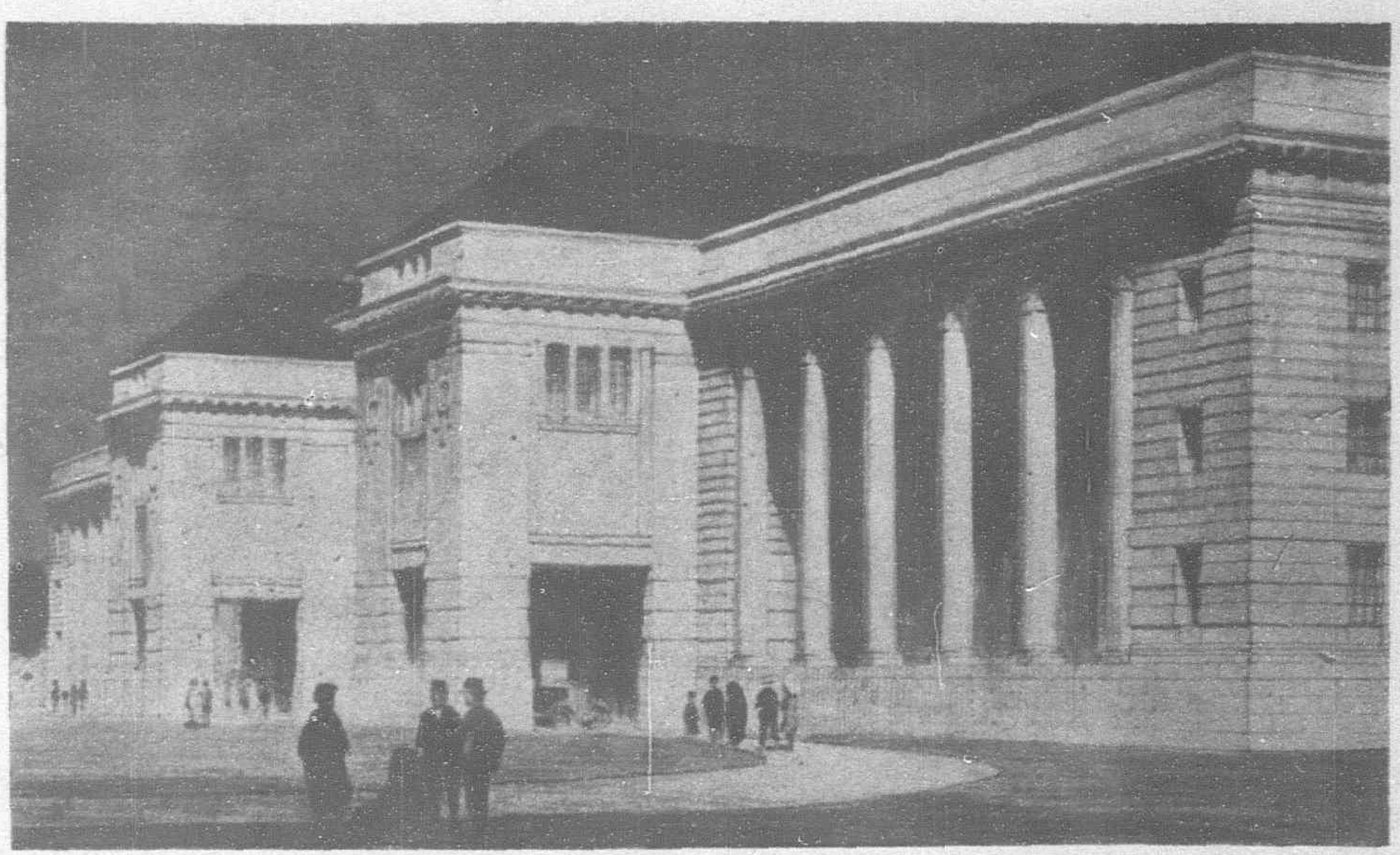
In accordance with its importance as the premier center of the administration of Justice in the State, it has been allotted a prominent and valuable site on the old Padang, set back sufficiently from the main road along the sea front to afford a suitable setting, and to give proper perspective to the building, and at the same time to obtain freedom from the noise of traffic.

The exterior is treated in a simple classic style in sympathy with the function of the structure, and with this object in view all detail throughout has been dealt with as simply as possible. Simplicity is also the key note of the interior, the intention of the designers being rather to obtain space, than to make inroads on the money available, by providing expensive or elaborate fittings and furnishings.

The building is 350 feet long and the two wings 60 feet in depth. The central portion is 44 feet in depth and the total area covered by the building is 23,000 sq. ft.

The site is on about seven feet of red earth filling, filled some thirty years ago or so into a mangrove swamp, and the foundations adopted were reinforced concrete slabs on close driven Bakau piling. Walling is in brick, and plastered. The two floors are formed in reinforced concrete on rolled steel joists, and cement rendered. Steel trusses carry the roof which is covered with Marseilles tiles. Ceilings to first floor are in asbestos sheeting. The walling up to ground floor level is faced in granite and all steps are in granite.

On the ground floor are arranged the Second Magistrate's Court and Office, Magistrate's Clerk Office, and a certain amount of office accommodation to be allotted to Departments other than these actually connected with the Courts.



New Law Courts, Johore Bahru

The Assistant Commissioner of Police, Courts, also has his office, and a strong room on the ground floor, as well as a lockup for prisoners. Above this on the Mazzaine floor is a second lockup for prisoners waiting trial in assize cases, and this communicates with the assize court by means of a private corridor and staircase which emerges into the dock. In the other wing are the lockups for the First Magistrate's Courts—with similar means of communication with the dock.

On the first floor are situate the Judges Courts, and the First Magistrate's Court, together with accommodation for the Registrar, Assistant Registrar, and Counsel, also Judge's Chambers, Judge's Private room, and the necessary offices for Secretary, Interpreter and Library.

The two Courts are each 74 feet long and 34 feet wide with seating accommodation for 160 of the general public, and behind the Supreme Court are the Judges' Chambers, Private Room, Robing Room and lavatory and a private verandah facing the east. These rooms have a teak floor and are teak pannelled throughout.

The remainder of the upper floor is taken up by the First Magistrate's Court and Office and the offices of the Registrar and D. P. P. and Staff.

There are separate private entrance porches provided for the Judge and the First and Second Magistrates and the same for the public, to the various Courts. The matter of arranging the many approaches and entrances to be noted on the plan had a considerable effect on the external appearance of the building, in conjunction with the advisability of taking advantage of the length of the site the line of which happened to offer advantage for avoiding glare in the various Courts and offices.

The Architects are Messrs. Stark & MacNeill and the Contractor Woo Mun Chew of Singapore.

Messrs. John Morey of Singapore carried out the electrical installation, and Messrs. W. Hill of Singapore, the sanitary installation.

Modern Office Appliances in Japan

(Continued from page 522).

Japan from China about 1,600 years ago ; most of them have lost their original sound, but retain their individual meaning, and those characters in combination with our own Kana, or phonetic alphabet, are always employed in our domestic correspondence. Thus, American typewriters are used only for international correspondence, the typewriters for our own home correspondence being quite different. They were invented and produced some twenty years ago to write about 2,000 ideographic characters in combination with the Kana, and machines of this kind are in popular use to-day.

There has been a movement to adopt the Romaji or Roman characters for writing Japanese, but the general adoption of the Romaji does not appear to be imminent.

In the case of the adding machine we find another peculiarity in the requirements of the Japanese market. Considering the progress and prosperity of the nation, it would seem that Japan does not import many adding machines. The reason is the soroban, or Japanese abacus. Every Japanese child learns in the elementary schools how to calculate by means of the abacus. So children and adults turn naturally to the counting frame with its beads whenever a problem in arithmetic is to be solved, and all are able to multiply and divide as well as add and subtract on this convenient and easily-operated abacus.

In the manufacture of stationery and office equipment and supplies in general Japan has progressed by leaps and bounds in the past twenty-five years. To-day a considerable amount of office equipment is made in Japan to meet her own particular needs and also to supply other markets of the East.

Yet, our importation of office equipment has also increased tremendously and there now comes into this country in a year about thirty times as much office equipment as was imported twenty-five years ago. The United States, of course, heads the list of importers into Japan.

The facts and data presented in this article are more than mere business statistics and observations. They are an indication of how rapidly the nations are becoming interdependent through international trade. The realization of this interdependence and the spirit of mutual assistance which grows from that realization play an important rôle in bringing about that frank friendship on which real peace and prosperity among the nations must rest.

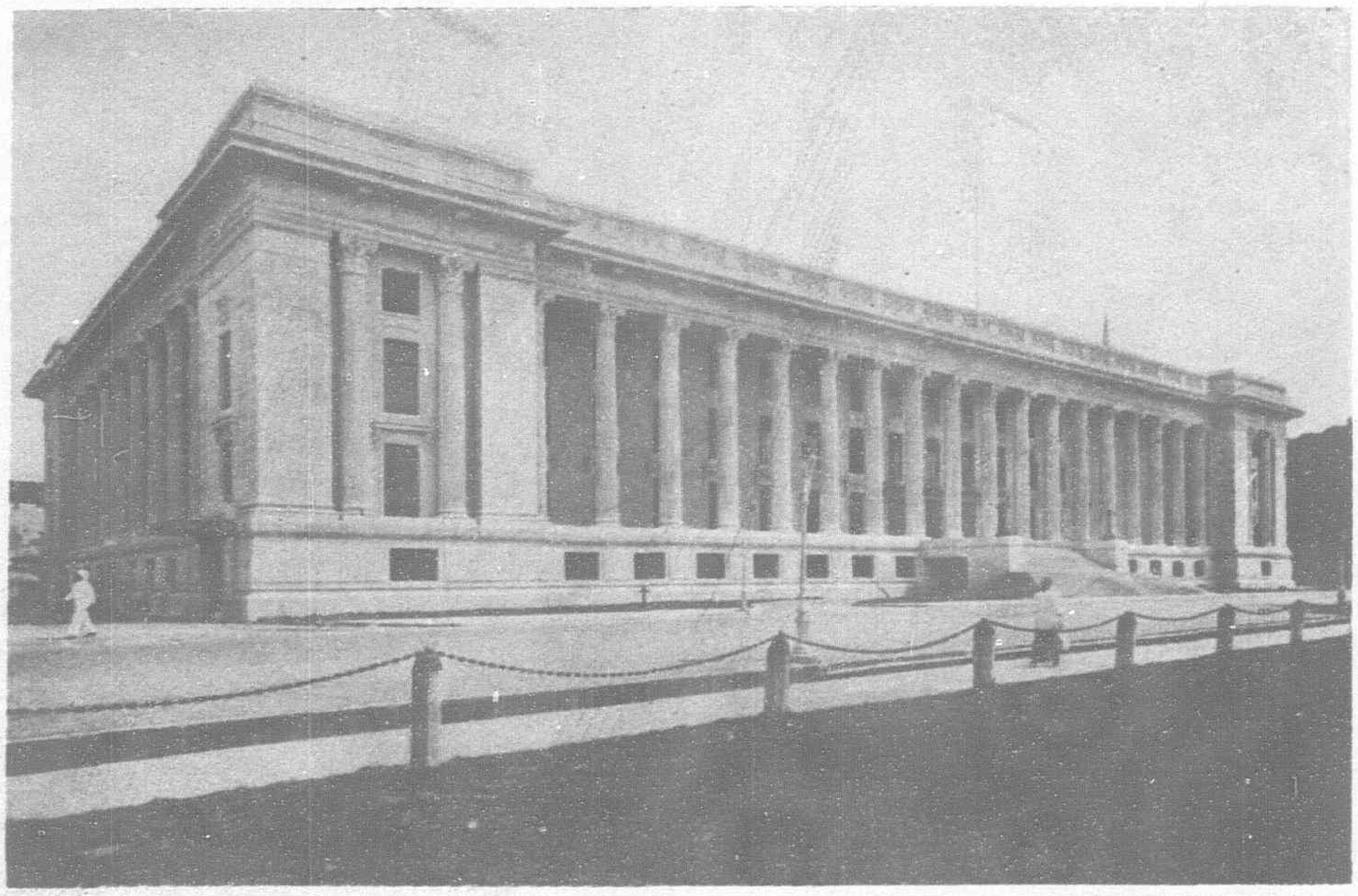
The Singapore Municipal Offices

THE new Municipal Offices are the latest addition to the few Singapore buildings worthy of architectural consideration, and form an imposing and dignified home for the activities of Civic Government.

The building is set back 50 feet from the line of St. Andrew's Road, and has a frontage thereon of 428 feet, with a depth along Coleman Street of 218 feet.

The elevation has been designed on simple and dignified lines with modern classic detail. The front to St. Andrew's Road has a façade of 18 fluted Corinthian columns each 41 feet high capped with artificial granite capitals. Above the façade there runs a wide cornice surmounted with a ten-foot parapet wall built of precast open-work panels topped with an appropriate coping. The façade is set off at either end by massive end features, and attention has been drawn to the center by a wide flight of granite steps 60 feet wide at the base leading to the main entrance 14 feet above the ground level. These stairs are flanked on each side by massive pedestals, each with a heavy cast-iron lamp standard.

The main entrance doors are of bronze, with a projecting balcony over encased in bronze, and the spaces between the bases of the pillars will be filled in with an ornamental cast-iron balustrade.



(*Architect, A. Gordon, F.R.I.B.A.*)

The New Municipal Offices

The elevations to St. Andrew's Road, the Europe Hotel, and Coleman Street are finished in precast artificial stone composed of "Medusa" white cement and fine crushed granite, with which the steel casement frames glazed with a greenish non-actinic glass forms a pleasing contrast.

The rear elevation and the court yards are finished in white cement plaster.

The foundations were designed with spread footings to each column allowing a maximum load of one ton per square foot, and in addition a raft has been placed under the foundations of the external walls to take the dead load of the masonry, and to avoid all chance of unequal settlement. The subsoil for a depth of 15 to 20 feet is of sand overlaying blue clay.

The plan of the building, which is designed in the form of a long rectangle with a center block, naturally divides the framework into five separate units. A front and rear block, two end, and a center block, and the separation has been attained by leaving an expansion joint from top to bottom of the building, between each block. These joints have on test been found to close three-eighths of an inch between sunrise and sunset, and have been successful up to the present in eliminating temperature cracks or those due to slight unequal settlement.

The ornamental work has been confined to the main entrance foyers, the main staircase, and the Committee and Board Rooms, while the interior finish is generally in plain plaster work with cement tiled floors. The corridors and interior staircases have tiled dados four feet high with rubber-tiled floors to simplify cleaning.

The first floor foyer is panelled and floored throughout with Sicilian marble, and the main staircase is in Sicilian marble with an ornamental bronze balustrade. On the main floor, which is the second, the foyer has a marble floor, with teak panelled dado, and from this foyer on the left one enters the Committee Room, while on the right are situate the offices of the President and Secretary. At the back of the foyer and occupying the whole of the center block is the Board Room.

This room has an imposing appearance, being 64 feet by 59 feet, with a height of 32 feet. The walls are panelled to a height of 11 feet with a fine teak dado, while the upper portion of the walls are covered with special Celotex acoustic tiles. The ceiling, which is built of reinforced concrete, has a solid panel over the table which will act as a sounding board. This is surrounded with open grill panels, which are covered with three layers of mats placed nine inches apart. At the level of the third floor of the main building there are two side balconies, which are supported by Corinthian columns in Sicilian marble with fine bronze bases and capitls.

The Committee Room and the President's office have teak parquetry floors and are finished with teak-panelled dados, with "Celotex" acoustic ceilings which have proved a great success.

A feature of the building is the main public office, with a counter topped by a bronze grille 275 feet long, and in a later number we hope to give some illustrations of the interior of the building showing the main features and the fine bronze work and marble.

Apart from the main front entrance there are four corner entrances each with a lift and staircase, and one important department has been located in each corner of each floor.

On the first floor are placed the Electrical Engineer, Municipal Treasurer, Gas Engineer, Municipal Building Surveyor and the Municipal Assessor.

The second floor accommodates the Singapore Improvement Trust, the Municipal Engineer, the Health Officer, and in addition the Secretariat, President's Office, and Committee Room and Board Room, whilst on the third floor are situate the Conservancy Department, Water Engineer, Bacteriologist and the Municipal Architect.

The drawing offices of the Engineer's and Architect's Departments and the laboratories of the Analyst and Bacteriologist are also on this floor to allow the necessary top lighting by means of skylights let into the flat roof, which is covered with hollow blocks to provide insulation from solar heat.

The architect was Mr. A. Gordon, F.R.I.B.A., and Messrs. Perry & Co. (Overseas), Ltd., were the contractors.

The sub-contractors were :—For Steel Casements and Bronzes work, The Crittal Manufacturing Co. ; for Rubber Floor Tiles, The Singapore Rubber Works ; Electric Lighting, etc., The United Engineers, Ltd.

Re-mapping China

Nanking, through the Ministry of the Interior, has instructed the various provincial departments of civil affairs that detailed maps should be prepared of municipalities and *hsien* within their jurisdiction for submission to the Ministry. The order states that detailed historial records of both townships and *hsien* should be carefully prepared together with definitions of boundaries, all of which are to be submitted to Nanking.

Engineering Notes

ELECTRIC LIGHT, POWER AND TRACTION

SOUTH MANCHURIA ELECTRICITY CO. —The South Manchuria Electricity Co. plans to spend about Y.2,500,000 for the estimated new enterprises during the next fiscal year.

One of the chief items is to instal new generators at the Amanogawa Power House (on the Hoshigaura tram line) which will cost about Y.2,200,000, which being split up over 2 years, the sum wanted for the next fiscal year will be a little over Y.800,000.

The transmitting lines from the Amanogawa Power House to the Shikishima Circle where the transforming station is located, are now laid along the railway, track, and, on this account, are exposed to frequent damage at the hands of the repairing gangs for the railway track. They are to be relaid along the base of the hill range, which work will cost about Y.300,000.

Other items refer to the construction and alteration of tram cars, improvement of the tram lines and the power transmitting lines, and the extenson of bus traffic.

DAI NI FUJI DENRYOKU K.K.—(No. 2 Fuji Electric Power Co., Ltd). It is reported that the Dai Ni Fuji Denryoku k.k. plans to build a power station, capacity 40,000 k.w. in Shizuoka Prefecture. There are to be installed two generators of 2,000 k.w. each and 2 units of 8,000 k.w. each. The company will probably invite estimates on equipments of this power station from all the makers the beginning of next year.

According to this report, the company plans to supply light and power in Shizuoka Prefecture and surplus power is to be supplied to Tokyo district in co-operation with the Fuji Donryoku K.K.

NAGANO PREFECTURE THE LARGEST POWER CENTRE.—The Kogyo Shimbun reports that Nagano and Toyama Prefectures are the largest electric power producing centers in Japan. Especially, in Nagano Prefecture there are 107 points where electric power is generated and the total output of these hydro-electric power plants is estimated at more than 340,000 k.w. The length of power lines amounts to more than 292,000 feet, while consumers of light and power in the Prefecture number more than 318,500 houses.

NIPPON ELECTRIC-OSAKA, ALLOWED TO ENTER TOKYO FIELD.—The re-application filed by the Nippon Electric Power Company, Osaka, with the Ministry of Communications for the supply of electric power to Tokyo, Yokohama and their vicinities has been sanctioned by the present Cabinet. The franchise involves the power supply to the district already mentioned, operation of the company's steam plant at Tsurumi and erection of necessary distribution lines.

The district involves Minami-Katsushikagun, Minami-Adachigun, Kita-Toyoshimagun and Tsurumi in Yokohama City. The power supply is limited to that of motors of more than 100 h.p. The power rate must not be high and that charged by other companies in Nagoya, Kobe and Osaka must be taken into consideration, it is instructed by the Ministry. Work should start within six months after the day of sanction and business opened in less than two years. The amount of power supplied by its Tsurumi steam power plant is 35,000 k.w. The application made by the Daido Electric Power Company for power supply over the same district has been reserved for the future, due to the investigation not having been completed yet. The new franchise given to the Nippon Electric Power Company will not interfere with the business interests of the Tokyo Electric Light Company, declared Mr. Shohachi Kakao, president of this company.

The Toho Electric Power Company has decided to absorb the Gifu Electric Power Company, capitalized at Y.5,000,000, sister institution to the former. The reason of absorption is that the Toho Power's Kamayama power station, capable of generating 4,500 k.w., is nearing completion and there is no necessity for the Gifu Power to exist.

RAILWAYS

THE RAILWAY COMPANIES IN KOREA. —The construction of private railway lines in Korea is proceeding steadily. These now under construction are the Chosen Tetsudo K.K. 50.8 miles, Keinan Tetsudo K.K. 42.3 miles, Kangosan Dentetsu K.K. 15.7 miles and Minami Chosen Tetsudo K.K., 99.5 miles, total 208 miles 24 chains. Besides these construction work on the Keito Tetsudo K.K. will be started in the near future (33.2 miles.)

The first part of construction of 35.3 miles of the Seishuto Junkan Kido K.K. (Seishu Island Encircling Tramway Co., Ltd.) has been completed and was opened to business from September 1, this year. The details of the line under construction are as follows:

Chosen Tetsudo K.K.

Kokai Line: Gauge, 3-ft. 6-in. 17 miles 56 chains. The Tsuruzaki Tunnel (2,772 feet) on the line is not yet completed: the whole line is expected to be opened by October next year. But the line from Shinin to Tsuruzaki will be opened on September 10 of this year.

Shinshu to Mizuhashi line: Gauge 3-ft. 6-in. 17 miles 72 chains, will opened on November 1, this year.

Kankyo Line: from Shinten to Mozan, Gauge, 3-ft. 6-in. 15 miles 16 chains, expected to be opened on December 1 of this year.

Keinan Tetsudo K.K.

Hirokawa to Okawa line: Gauge 4-ft. 8½-in. expected to be opened on December 1, 1929.

Keinan Tetsudo K.K.

Hirokawa to Itabashi line: Gauge 4-ft. 8½-in. 17 miles 72 chains. There are 3 tunnels between Itabashi and Choko, the total length of them is 7,200 feet, the whole line will be opened by the end of next year.

Kongosan Denki Tetsudo K.K.

Keiri to Kokei line, Gauge 4-ft. 8½-in., 7 miles 40 chains.

Kakei to Kongosan, 8 miles 12 chains. The whole line will be completed by the end of next month.

Minami Chosen Tetsudo K.K.

Raishu to Kosui line, Gauge 4-ft. 8½-in., 9 miles 72 Chains, Construction started on February, at present about 2 per cent of the line has been completed. Expected to be opened by the end of next year.

THE HU-HAI RAILWAY.—The completion of the Hu-hai Railway, running from the suburb of Harbin to Hailun marks the beginning of the huge Chinese program of construction in Manchuria. The Hu-hai Railway is a pure Chinese enterprise, capitalized at $10,487,709 Harbin currency, with a total mileage of 220 kilometers. The managing-director is Mr. Kao Yuan-kun. The railway has to its credit eight locomotives, 220 freight wagons with a capacity of 30 tons each; 50 passenger coaches with a seating capacity for 100 persons each; and before the year ends 10 more locomotives and 200 more freight wagons will be added to its rolling-stock.

Actual construction work started in the spring of 1926, but Mr. B. Ostroumoff the engineer, completed only 20 kilometers from Sunpei, a suburb of Harbin, to Hulan.

Construction of the 200 kilometers from Hulan to Hailun was continued by a Chinese engineer, Shih Yi, and the entire administration both technical and general was in the hands of Chinese. At present, no foreigner is in the employ of the railway, except two advisors. The authorities of the railway are inviting shares from merchants and commercial bodies with a view to converting the railway into a commercial enterprise, so that government funds can be appropriated for the extension of the railway and the construction of other railways in the province.

The gauge of the Hu-hai Railway is 4-ft. 8.5-in., similar to that of the South Manchuria Railway and other Chinese railways. In 1928 the Railway placed an order for five new locomotives and 100 wagons. Notwithstanding the limited activity of the Railway, altogether 500,000 tons of export goods were hauled along the main line, and a considerable number of passengers were carried. The financial condition of the Railway from July 1, 1927 to June 31, 1928 is shown in the following table:

(IN HARBIN LOCAL DOLLARS)

REVENUE

1. From Passenger traffic	$886,000
2. From freight traffic.	$2,007,000
3. From other sources	$221,000
Revenues in Total	$3,114,000

EXPENDITURE

1. General expenses	$224,000
2. Expenses for exploitation	$558,000
3. Traction department	$390,000
4. Machine department	$231,000
5. Other expenses	$135,000
Revenues in Total	$1,538,000

Revenue	$3,114,000
Expenditure	$1,538,000
Profit	$1,576,000

The territory across which the Hu-hai Railway runs, is a high level plain, having on its north, west and east the ranges of the Great Kingan Mountain. Being well irrigated by the tributaries of the Sungari River, it is considered the best region for agricultural purposes in all Manchuria. The number of immigrants from Shantung and Hopei in this region is steadily multiplying. The climatic condition of this territory is also considered better than that of the adjoining highland of Kingan in the west or the hilly regions in the east. The high ranges of the Kingan Mountains in the northwest prevent the Siberian blizzards from sweeping across the land, and for this reason the territory is not so exposed to cold winds as other places in the north and west do. The weather in this territory is comparatively mild, in the summer, however, the mercury rising higher than that in other regions of the same latitude. The annual rainfall in the early part of summer gives enough moisture to the wheat and other cereal crops, thus causing rapid growth, and the dry season that follows makes conditions favourable for the harvest.

Colonization of the territory by Shantung immigrants commenced with the construction of the railway line in 1925, pioneer farmers spreading by thousands along the railway track and reaching remote regions in the interior. Although the terminus of the railway is at Hailun, immigrants have proceeded even as far as Tungpei and Lungjen. It is planned to extend the railway to these places. In view of the fact that this territory is chiefly fit for agricultural purposes, the bulk of the population lives on farming, a very small number being engaged in commercial and industrial undertakings.

CONSTRUCTION OF NEW RAILROAD, FRENCH INDO-CHINA.—The Government-General of Indo-China has presented a plan, having for its object the construction of a railway to link the river port of Pnom-Penh with Battambang, a distance of 275 kilometers, states a report from Consul Henry S. Waterman, Saigon, French Indo-China. This is the central section of the railway 654 kilometers propsed from Saigon to the Siamese frontier, which is included in the plan of the law to provide for a general program of development of the French colonies. The estimated cost of the proposed branch is 17,000,000 piasters ($8,500,000) and the period of execution will be about five years.

CANTON-HANKOW RAILWAY.—Construction of the uncompleted Chuchow-Shiuchow section of the Canton-Hankow Railway will be started shortly, according to an announcement made at the Ministry of Railways. Mr. Sun Fo, Minister of Railways, issued an order to the Peiping-Liaoning, Peiping-Hankow, Tientsin-Pukow and Canton-Hankow Railway Administrations to make monthly remittances to facilitate the immediate starting of the work. All moneys advanced by the various Railways will be refunded as soon as arrangements are completed for the turning over to the Ministry of part of the Returned Boxer Indemnity from Great Britain earmarked for the purpose. The ministerial order specifies that the remittances are to be made beginning with the month of November with the Peiping-Liaoning Railway sending $100,000; the Peiping-Hankow Line, $200,000; the Tientsin-Pukow Line, $80,000 and the Canton-Hankow Line, $120,000.—*Kuo Min.*

ELECTRIC RAILWAY SERVICE TO NIKKO.—The time from Tokyo to Nikko has now been shortened to two hours and forty minutes by the efforts of the Tobu Electric Railway Company, of which Mr. Kaichiro Nezu, of Tokyo, is president.

The line connects Asakusa station, beyond the River Sumida, and Tobu-Nikko, the entrance to the shrine town. The distance from Asakusa to Tobu-Nikko station is 83½ miles, about six miles shorter than the government line. By this line Nikko, from the capital, is reached within three hours by ordinary trains, and two hours and forty minutes by special express trains.

The Tobu Electric Railway Company has expended Y.15,000,000 on the construction of the double track from Sugito to Tobu-Nikko, whose distance is about 58 miles.

The company is extending its line from Asakusa station to Asakusa park, one of Tokyo's amusement centers, crossing the River Sumida, thus directly connecting with the tram-lines and subways in the city. The bridge for this extension over the river is now under construction, between the Azuma and Kototoi bridges.

The electric trains on the Asakusa-Nikko line run every forty minutes from 5 a.m. to 7:45 p.m. The cars are all steel, equipped with up-to-date lighting, heating, ventilation, etc. The special express trains run on Sundays and national holidays, during the maple season in October and November.

The passenger fare is Y.2.23 from Asakusa to Tobu-Nikko station. Tobu-Nikko station connects with the Nikko electric railway to the Toshogu Shrine and Umagaeshi. The maples at Nikko are now at the height of the season.

NEW CHINESE MANCHURIAN RAILWAY.—The North Eastern Communications Commission, Fengtien, has decided to build a new line from Yentungshan Station on the Kirin-Hailungcheng Line to outside South Gate, Changchun, via Shuangyuang to the end of connecting the first mentioned line with the C.E.R. Southern Section at the outlay of $3,000,000 to be put up in an equal share among Kirin and Liaoning Provinces and the Kirin-Hailungcheng Line.

Construction is to be started during the Spring.

INDUSTRIAL

ISHIKAWAJIMA ZOSENJO K. K.—(Ishikawajima Shipbuilding Co.) The Ishikawajima Zosenjo K.K. has taken an order for an ammonia compresser (1,500 h.p. 300 atmospheric pressure) from the Showa Hiryo K.K. (Showa Fertilizer Co., Ltd.) Recently this Company completed negotiations for the manufacturing rights of ammonia compressers of Sulzer Brothers in Japan will be, and the manufactures named "Ishikawajima-Sulzer Compresser."

SODA FACTORY IN SOUTH MANCHURIA.—The South Manchuria Railway Company proposes to erect a soda factory in the Kwantung Leased Territory with a potential annual producing capacity in the course of the first years of up to 50,000 tons. The construction of such a works is called for by the demand for soda on the part of the growing chemical industry in Japan, and the impossibility to satisfy such requirements by the output of the soda factories existing in Japan proper.

MITSUI KOZAN K.K.—(Mitsui Mining Co., Ltd.) The Mitsui Kozan K.K. plans to manufacture anilin dye stuffs, conpound ammonia, etc., of which the manufacture of conpound ammonia by the Claude Process will first be taken up. It is expected that the company will buy machinery and equipment such as Hydrogen extraction equipment, Holders, 6-7 units of compresser of about 1,000 atmospheres, 6 units of gas holders of high pressure, electrolysis tanks and accessories. The total is expected to be about Y.3,000,000 Y.4,000,000.

PETROLEUM AND GAS PRODUCTION IN FORMOSA IN 1928.—According to the Formosan Goverment, the production of petroleum and gas in Formosa in 1928 was as follows:

Shukko Field		
Raw oil	15,678	Kilo Litre.
Volatile oil . ..	2,351	,, ,,
Natural Volatile Oil	365	,, ,,
Gas	1,269,949	Cu. Ft.
Kinsui Field		
Natural Volatile oil.	491	Kilo Litre.
Gas	3,635,350	Cu. Ft.
Taiwan Seiyujo (Taiwan Refinery)		
Volatile oil . ..	4,881	Kilo Litre.
Kerosene oil. ..	2,781	,, ,,
Light oil	2,584	,, ,,
Heavy oil	1,444	,, ,,
Parafine	272,430	,, ,,

YAWATA IRON WORKS.—Since 1927, the Yawata Iron Works has been electrifying its factories. Recently it began operation of a mill, in which a motor with a capacity of 18,000 h.p. of the Allgemeine Electric Company is installed. The total cost of machinery will be about Y.420,000.

The Yawata Iron Works has decided to install 2 units of Babcock boilers, capacity of 20,000 k.w. and one unit of Hitachi Seisakujo's boiler as reserve in No. 4 power station.

This boiler is "Yaro" type, heating surface 13,000 Sq. meters, pressure 371 pounds, most Y.230,000.

MITSUI BUSSAN K.K. AND NIPPON SEKIYU K.K. TO DRILL FOR OIL IN BORNEO.—The Mitsui Bussan K.K. and the Nippon Sekiyu K.K. have decided to drill for oil at Kuchi (phonetic) oil field, co-operating with the East Borneo Co., Ltd. The surveys for drilling for oil will be completed by the end of this year, and the companies will begin operation from March next year. Mr. Nishimura, former engineer of the Kita-Karafuto Kogyo K.K. will start to investigate the field in the near future.

SHIPPING AND SHIPBUILDING

OSAKA SHOSEN KAISHA'S 17-KNOT SHIPS.—Reference was made in our last issue to orders for four cargo ships placed by the Osaka Shosen Kaisha. They will be 445-ft. long with a beam of 60 ft. 6-ins. and a depth of 40-ft. 9-ins., and the two Mitsubishi-Sulzer engines in each ship will develop 7,200 b.h.p. A trial trip speed of 17 knots is called for. These vessels are for transpacific service.—*The Motor Ships.*

O.S.K. LINERS WILL TOUCH AT BELEM.—Starting with the *Manila Maru*, the O.S.K. South American liners will call at Belem, Brazil, after Rio De Janeiro, on their return voyage, it has been tentatively decided by the shipping company. Since this will be simply for the transportation of emigrants from Japan to the Nanbei Takushoku Kaisha, it will cease when the number of colonists bound to this Brazilian Port is too small to warrant the service, it is stated by the Tokyo office of the shipping company.

The O.S.K. South American service will be greatly improved soon when the new motorships *Rio De Janeiro Maru* and *Buenos Aires Maru* of 9,400 tons gross and a speed of 14 knots, are placed on this run. The two sister ships, which are now under construction at the Mitsubishi Yard, Nagasaki will be completed in November and April respectively. The *Rio De Janeiro Maru* will leave Yokohama on November 14.

DIESEL SHIP CONSTRUCTION ACTIVE IN JAPAN.—The ships under construction at the end of July at the shipyards throughout Japan totalled 38, with 182,035 tons, according to the Communication Office. The vessels launched during July totalled 3, with 3,800 tons, making a total of 48, with 102,309 tons since January 1, 1929.

Only one vessel, representing 233 tons, was completed in July, and the total number of ships, the construction work of which has been completed since January 1, was 43, with 52,939 tons.

After a long spell of prosperity, the shipbuilding industry in Japan now shows a declining tendency, unfavourably influenced by the retrenchment policy of the Hamaguchi Cabinet, and no more negotiations for construction are being carried on. However, the shipbuilding industry during July was somewhat active as compared with June. The ships under construction for January numbered 50, with 156,061 tons; those for February, 49, with 159,705 tons; those for March, 49, with 165, 105 tons; those for April, 49, with 176,455 tons; those for May, 42, with 173,724 tons, and those for June 36, with 181,345 tons. The construction of Diesel boats was still very popular, and the greater part of the ships, under construction in July were motorships.

DUTCH LINE'S NEW FLAGSHIP FOR EAST INDIAN TRADE.—There has recently been launched from a Rotterdam shipyard the twin-screw passenger motor vessel *Buloeran*, of 17,000 tons gross register, for the Rotterdam Lloyd Mail service to Batavia. The vessel, which is to be followed by a sister ship named *Dempo*, is of 574¼ ft. in length and 70-ft. breadth; from keel to navigating bridge the height is 82 feet. Great care has been paid to the design not only of the under-water portion, but of the above-water portion and superstructures as well, and she promises to have a characteristic appearance when completed, the short elliptical funnel of 36 feet height and 33 feet by 18 feet diameter adding to this effect.

The cellular double bottom extends right fore and aft and seven watertight bulkheads divide the ship in eight compartments. Sixteen lifeboats, an emergency boat and a motor launch will be carried under Columbus patent davits. Interesting navigational aids include gyro-compass, radio direction-finder, submarine signalling apparatus, etc., in addition to a very complete and up-to-date radio equipment. Cargo spaces have a total capacity of about 300,000 cubic feet, and for the handling of cargo eight electric deck cranes will be installed. Accommodation for passengers and crew has been carefully laid out on eight decks, the maximum number provided for being 238 first class, 230 second class, 170 third class, and a number of fourth-class passengers (troops), with 330 crew.

All first-class accommodation is in deck cabins, none of which touch the skin of the vessel, and consists of two suites de luxe, 12 cabins with private bathrooms, 64 other two berth cabins, and no less than 82 one-berth cabins. Except where technical requirements prevented the fitting of communication doors all cabins are connected by doors, and each cabin has a washstand with running water, lockers, desk or toilet table, and electric stove.

Spacious stairways and two electric passenger elevators from the connection between the promenade deck and first-class dining room, of 3,800 square feet floor area, and seating accommodation for 230. The first-class smoke and music room will have a floor area of 4,100 square feet, the reading room has an area of 550 square feet, and the nursery 915 square feet. The area of promenade decks is 17,250 square feet.

The second-class accommodation is right abaft first-class amidships, and consists of 180 berths in deck cabins—about 65 per cent. of the total. The public rooms include a dining room of 3,900 square feet, smoke and music room of 3,500 square feet, and nursery of 680 square feet. The promenade deck has an area of 12,050 square feet.

One-half of the third-class accommodation is in two-berth cabins; public rooms include a dining room of 1,030 square feet, and a smoke room of 615 square feet. There is 4,900 square feet of promenade deck and also a large open swimming bath 26 feet long, 20 feet wide, and a maximum depth of 6 feet 6 inches. The hospital, with operating room and lazaretter for infectious diseases, is provided with the most up-to-date appliances.

The propelling machinery consists of two Schelde-Sulzer Diesel engines with cylinders of 760 mm. stroke, and air compressors driven direct from mainshaft. Each engine will develop 7,000 shaft horse-power, and the vessel will have a sea speed of 18½ knots. Scavenging air will be supplied by electric Brown-Boveri centrifugal air pumps, a duplicate set being installed, of which each section will be of sufficient capacity for both engines.

Electric current for auxiliaries, heating, and lighting, for which 7,000 lights are fitted, will be supplied by four d.c. diesel generators of 510 kw. capacity each, which are driven by four six-cylinder Schelds-Sulzer engines, with cylinders of 380 mm. diameter by 660 mm. stroke, developing 780 shaft h.p. each.

Exhaust gases of auxiliary diesel engines, and part of the exhaust gases of the main engines are used to raise low-pressure steam, which is employed to raise the temperature of the salt water in the swimming bath when required, and of fresh water supplied to central washstands, cabins-de-luxe, and galleys. Compressed air will be stowed in two vessels of 812 cubic feet each at 375 lbs. pressure per square inch, and in 13 high-pressure air bottles of 264 gallon each at 1,000 lbs. pressure per square inch. Diesel oil will be carried in five double-bottom tanks, six deep tanks, and in an anti-rolling tank, the aggregate capacity being 2,300 tons.

The *Baloeran* will be the flagship of the Rotterdam Lloyd's Javan mail service.

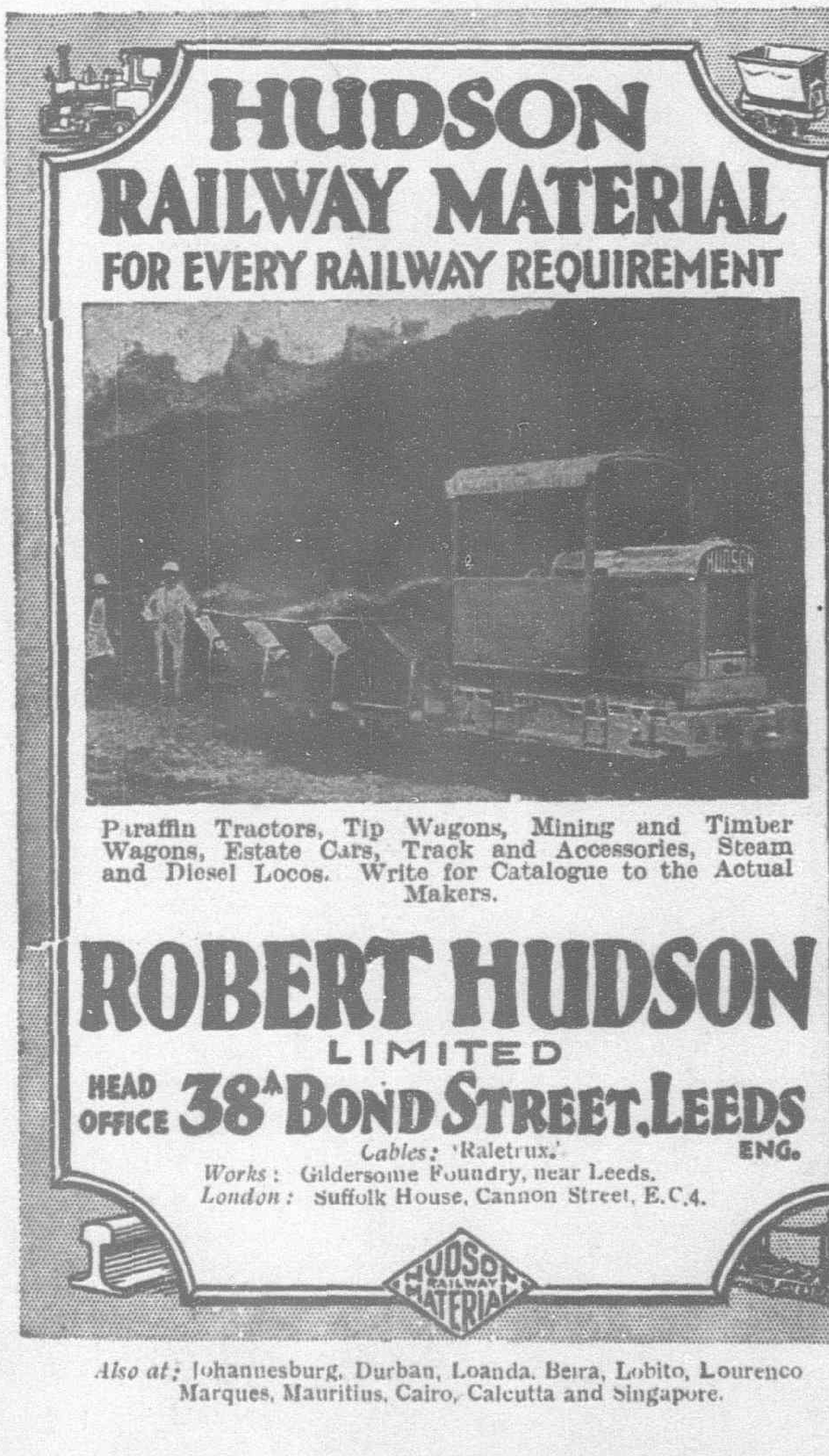
ELECTRIC PROPULSION OF SHIPS.—It is not always realised to what extent electricity is now used aboard ship, not only for auxiliary services but also for propulsion purposes. Considerable publicity has been given to the successful results obtained by the P. & O. twin-screw turbo-electric liner "Viceroy of India" and it is interesting to note that the British Thomson-Houston Co., Ltd., Rugby, which manufactured the propulsion equipment, has on order at the present time not only turbo-electric propulsion equipments for three other ships, but also propulsion equipments for two Diesel-electric oil tankers. The latter equipments are similar to that which this Company manufactured for the Atlantic Refining Company's oil tanker "Brunswick," the largest Diesel-electric ship so far built in this country.

Electricity is also helping ship owners to modernise older vessels, and the British Thomson-Houston Company has on order six equipments in which the exhaust steam from reciprocating engines is used in turbines driving generators which supply electrical power to motors on the propeller shafts, and generators which are used for electric lighting, heating, cooking and motor services. The additional power thus made available for propulsion purposes can be used either to increase the speed of the vessels or to maintain the existing speed at greater economy.

SHIPBUILDING IN JAPAN.—According to the investigation on the 1st of July, the total steamers of Japan under construction were 7 ships of 13,630 tons, while motor boats showed 27 ships of 163,215 tons at the same period. The tonnage of motor boat is ten times that of the former, and this phenomena shows so plainly that the present time is inclining to the diesel engine age. The details of vessels under construction according to those shipbuilding yards are as below:—

		No. of ship	ton
Yokohama Dock Co.	,,	6	57,850
Asano Ship Building Yard ..	,,	1	130
Kanehashi Shipbuilding Yard .	,,	3	560
Harada Shipbuilding Yard ..	,,	1	800
Osaka Iron Works	,,	2	20,500
Mitsubishi Shipbuilding Yard, Kobe	,,	1	11,650
Kawasaki Shipbuilding Yard ..	,,	7	8,200
Harima Shipbuilding Yard ..	,,	1	150
Mitsui Shipbuilding Yard ..	,,	4	7,860
Miyazaki Shipbuilding Yard ..	,,	1	150
Mitsubishi Shipbuilding Yard, Hikoshima	,,	1	640
Mitsubishi Shipbuilding Yard, Nagasaki	,,	7	81,800
Total	,,	35	181,345

BELGIAN LINE OPENS SERVICE TO ORIENT PORTS.—Monthly service from Antwerp to the Far East, has been inaugurated by the Lloyd Royal Belge, S. A., with Singapore, Hongkong, Shanghai, Pukow and Dairen as ports of call on the outbound voyage, it is announced by the Glen Line Eastern Agencies, Ltd. who have been appointed agents for the company here. The return voyage will be made via North Pacific Ports of the United States, then home through the Panama Canal.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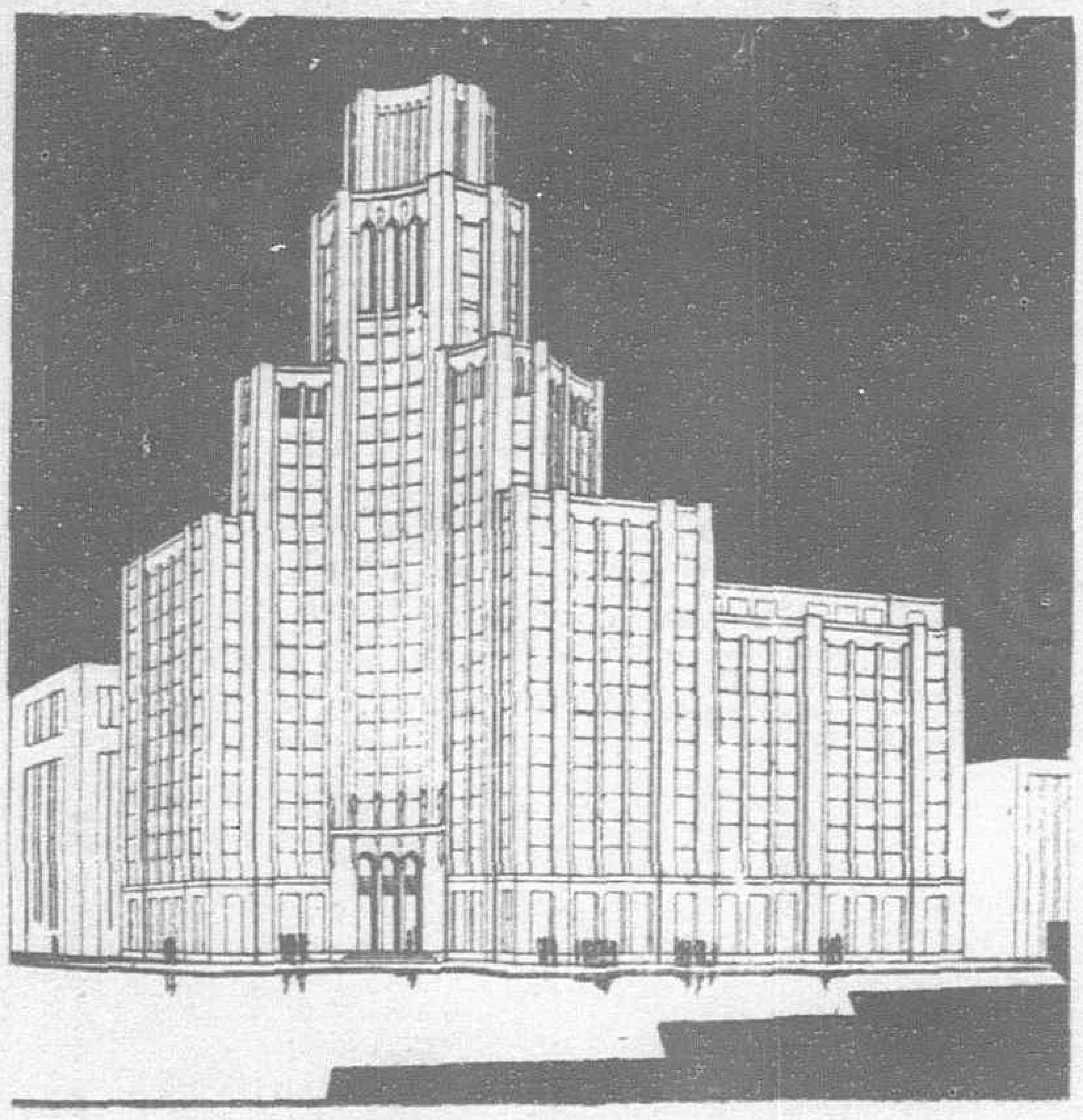
BUILDINGS

NEW 14-STOREY BUILDING FOR SHANGHAI.—The latest addition to Shanghai's tall buildings is to be erected at the North corner of the intersection of Kiangse and Foochow Roads opposite the Municipal Building to the order of Messrs. E. D. Sassoon & Co., Ltd. and has been designed by Messrs. Palmer and Turner, architects.

It will be an imposing structure and from the plans and drawings will be a distinct feature in the architectural renaissance of this city. With the gradual but sure changes in the architectual appearance of Shanghai and the slow but steady disappearance of much of the old type of Chinese building, innovations in this class and type of structure are bound to come. Something new has been introduced by Messrs. Palmer & Turner on this occasion as will be seen by the accompanying drawing. The building has been modelled along the lines of the largest skyscrapers so common in American cities and though, by no means as tall, has most of the outstanding characteristics. With the exception of the ground floor and the first three storeys, the remainder of the 14 floors will be devoted to bachelor apartments and flats.



The main entrance will be situated on the angle of Foochow and Kiangse Roads the ground floor being devoted to space for large offices, banks and similar business concerns. The next three floors will be devoted to offices. The remaining floors will consist of apartments for bachelors and the upper storeys will comprise large flats of a very attractive design, each having every modern convenience.

As will be seen by the accompanying picture the building has been designed on the set-back principle, the respective floors diminishing in size as they approach the top of the building. The fourth, fifth sixth and seventh floors will be devoted to bachelor apartment with special dining and kitchen service on each, whilst the upper floors will consist of well-designed flats with its own service arrangements and conveniences. These flats will also have the added attraction of their own roof gardens as the result of the setback system of building.

It is estimated that the completed building will cost more than Tls. 750,000.

PUBLIC WORKS

BIDS CALLED FOR BRIDGE OVER IRAWADY RIVER, INDIA.—The Burma Railways have called for bids for a ¾-mile bridge over the Irawady River, consisting of nine 350-foot spans and one 250-foot span, with piers and abutments, It is estimated that this project will cost £1,000,000. Alternative tenders have also been invited for (1) construction of piers and abutments and supply and erection of steel work, or (2) manufacture, transportation to Rangoon and erection at site, of steel work, or (3) manufacture and transportation to Rangoon of steel work, including one 350-foot service span, with supports, and an electrically driven erecting traveler.

NANKING WATER SUPPLY PROJECT.—The public works department of the municipality of Nanking is considering the installation of a modern waterworks system at an approximate cost of $2,000,000. Some of the requirements for this project area a power plant, one steam-turbine condenser, watertube boilers, pumps, and other equipment necessary for the installation of a complete waterworks system.

TELEPHONE, TELEGRAPH AND RADIO

CANTON 'PHONE EXTENSION.—It will be remembered that during the course of September long-distance telephones were opened between Canton and Fatshan, and Canton and Shek Lung. The latter line has now been extended to Waichow and it is now possible to phone from Fatshan or Canton direct to that city.

The total distance of line from Fatshan to Waichow must be close on one hundred miles. The charges are 29 cents Canton to Waichow or 40 cents Fatshan to Wiachow for every five minutes.

Wiachow, Fatshan and Shek Lung are still on the old telephone systems, whereas Canton has been on the automatic system since the 25th August.

The lines connecting these cities are the old style overhead wires, but with the laying of the Canton-Hongkong underground cables for the telephone service to be put into operation not later than the 31st August next year, the lines between Canton, Shek Lung and Wiachow will also be carried through the new underground cables.

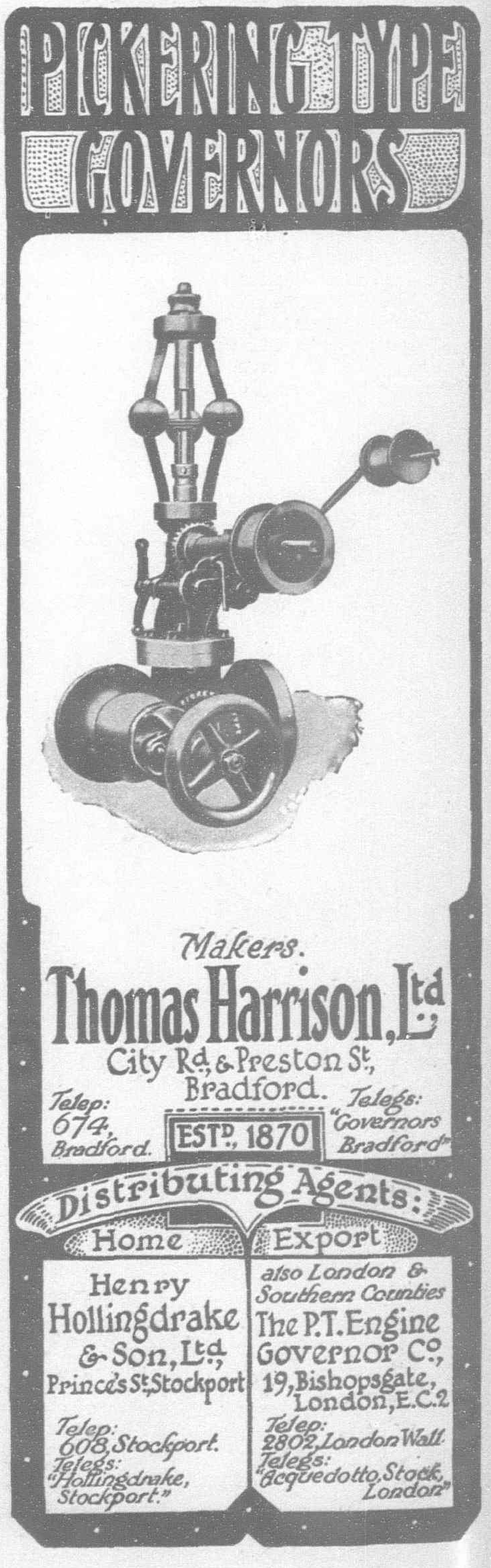
A NEW WIRELESS STATION IN TIENTSIN.—A new wireless station will probably be erected in Tientsin in about two months' time and a through wireless service with Canton and Sinkiang established, according to the scheme of the Ministry of Communications for wireless development. The new station will have a wave-length of 2,000 kilometres, twice that of the present and the machinery has been ordered from the United States. Though wireless communication with Sinkiang was started recently messages are being transmitted via Mukden at present, costing 30 cents per each Chinese word in plain language and 45 cents for English and Chinese code word. After the installation of the new station Tientsin will be able to communicate directly with every part of the whole country, although it will not be strong enough to establish connection with foreign countries.

AVIATION

OSAKA-DAIREN AIR SERVICE STARTED.—A daily commercial air service is being opened between Osaka and Dairen, via Chosen. A similar service between Tokyo and Osaka has been in operation for some time.

SIX AIRPLANES SENT TO SHANSI.—Six Moth airplanes are expected to arrive at Taiyuanfu for the Shansi government this morning. They are being delivered by Captain W. E. F. Jones, head of the aviation department of Arnhold & Co., Ltd. Captain Jones was a flying instructor and aeronautical advisor to the Chinese government from 1921 to 1923, and lived in Peiping during that time. There have been 20 Moth planes sold in China. All are in daily operation in the hands of Chinese pilots who handle them with exceptional skill, performing aerial evolutions such as loops, spins and rolls, according to Captain Jones. The Moth is a bi-plane of small dimensions manufactured by the d'Havilland Aircraft, London. It has a wing span of 30 feet, and an approximate length from propeller to tail of 25 feet. It is fitted with a 100 horse-power d-h. cooled engine. A speciallty is its folding wings. When the wings are folded back the plane can be housed in a garage, as its width is then only 9 feet, 10½ inches. An outstanding feature of the engine is the fact that it burns ordinary motor gasoline and will run at the rate of 20 miles to the gallon. It has a full speed of 105 miles per hour and a cruising speed of 85 miles per hour at 1,800 revolutions per minute.

CENTRALIZATION OF AIR ADMINISTRATION CONTROL.—The State Council, in an order to the Ministry of War instructs that with the exception of the air mail service operated by the Ministry of Communications, all other aviation office throughout the country must hereafter be placed under the direct control of the Aviation Department of the Ministry of War so as to centralize the administration thereof. Notifications to the above effect are being despatched to the various Aviation Departments in Liaoning, Yunnan, Canton and Si-an, the Aviation Academy in Taiyuan, and the Provincial Preparatory Office in Chungking. According to a plan of Commander-in-Chief Chiang Kai-shek, all military airplanes in the country will also be concentrated at the Capital to facilitate centralization of command. A Central Aviation Academy will be opened in the Capital for the training of an adequate number of pilots. To encourage the public to travel by he Shanghai-Nanking air passenger service, the Ministry of Communications has decided upon a further reduction of the fare from $36 to $26. The new fare took effect as from September 27.



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